

MOTOR AGE

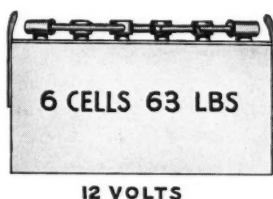
Vol. XXVIII
No. 7

CHICAGO, AUGUST 12, 1915

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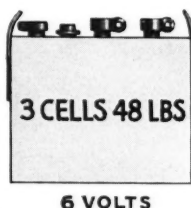
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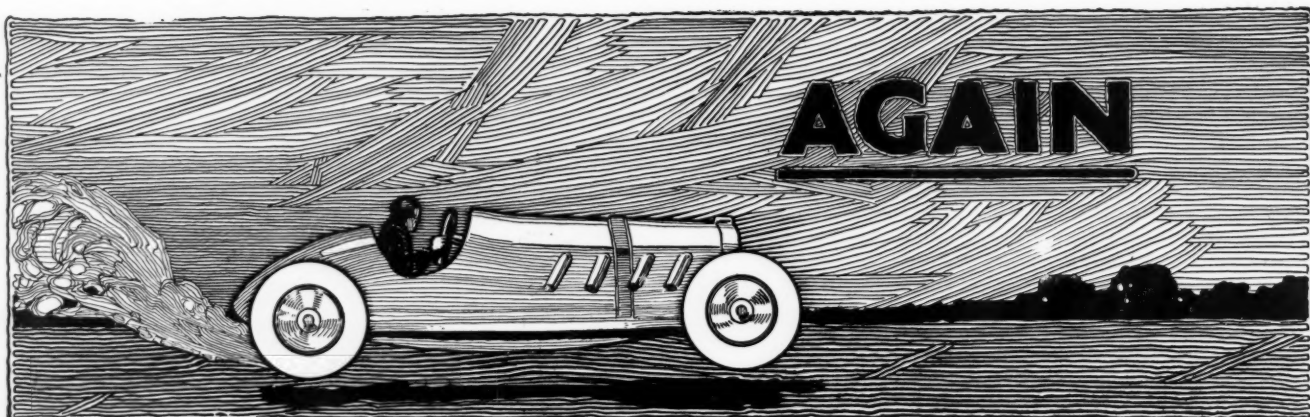


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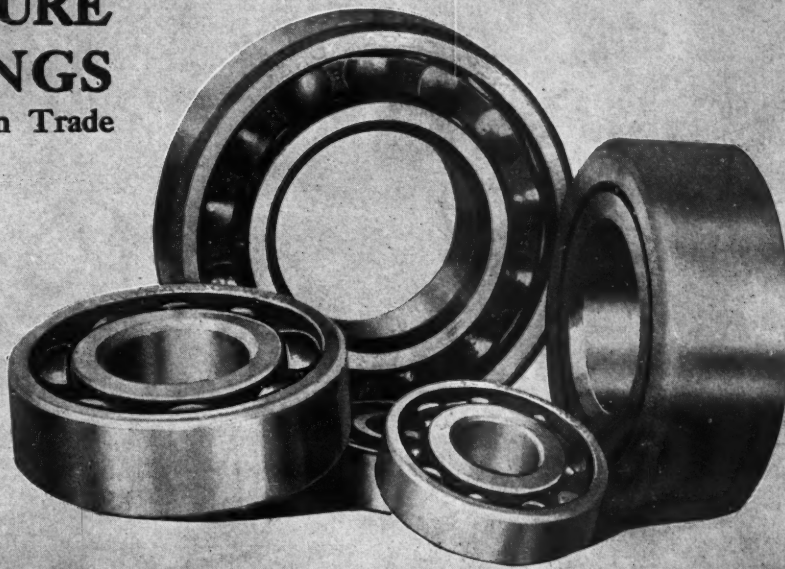
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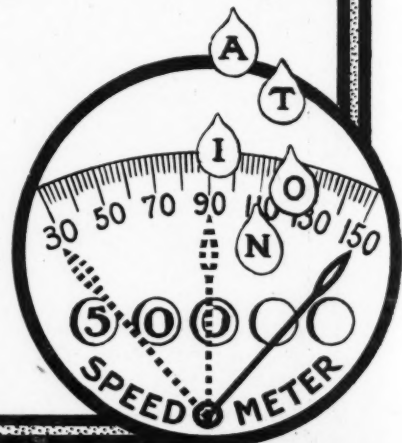
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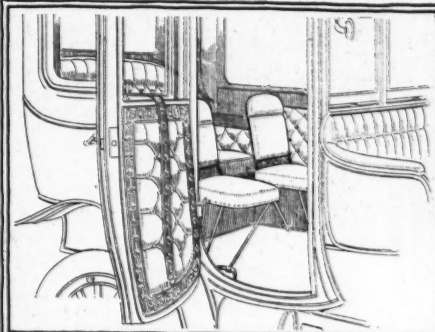
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—NEXT WEEK—

You may not be contemplating a motor trip through Yellowstone Park this season; nevertheless you will be interested in the experiences of one of the first tourists to enter Uncle Sam's playground when it was thrown open to cars August 1. "Motoring in Wonderland," which is the feature of Motor Age for August 19, offers a view of America's natural palace of mysteries from a new angle—the seat of a motor car.



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MOTOR AGE

Where Graves Are Road Markers

Bradley Describes a Tour Among the Ruins of the Eastern Portion of the Marne Battlefield

By W. F. Bradley

Motor Age's Special War Correspondent

IN a country where private motoring is taboo, the man who wants to burn up gasoline is apt to run into all kinds of difficulties. We were sitting outside the Café Lorraine, at Nancy, listening to the drone of aeroplanes going to the nearby battle line, and watching the passage of officers' cars, motor trucks, aeroplane floats and repair wagons, Red Cross ambulances and troopers wearing every kind of uniform.

On the facade of a billiard room directly opposite, an official road sign tantalizingly held our attention. We read "Meurthe et Moselle, Route Nationale No. 74, Chateau-Salins 30 kilometres." As a simple mental calculation showed, 30 kilometres equaled 18 miles; and as our guide book informed us, Chateau-Salins was in Germany—or at any rate, in that part of Germany which the French prefer to describe as "the annexed country."

"Just press a pedal and push a lever, and we shall be there in half an hour," I remarked to my companion.

"Sure," replied my companion, "but it may take us 10 years to return."

That reflection removed all desire to travel down National

This is the second article to be published in Motor Age describing a tour of the Marne battlefield. The first was printed in the issue of March 18 under the title "Following the Confetti of Mars," and dealt with the western portion.—The Editor

Highway No. 74, for Chateau-Salins is in that no-man's land swept by French and German guns, or perhaps held by one force and bombarded by the other. It is difficult to get the exact location of the battle line from the official communiqués.

Except for a wrecked cemetery and a few bombarded houses in one suburb, souvenirs of the great battle the Germans delivered to the northeast of the city last year, when the emperor waited in vain for the opportunity to march into Nancy—there was not much to attract us there.

We went hat in hand to the central police station and asked for a pass to travel by motor car to Paris. The man behind the desk that gave out passes to women and children who needed to walk to villages within a 5-mile radius, did not say that we were crazy, but we knew that was what he meant. Instead, he put the blame on the Paris officials who had informed us that they saw no difficulty in bringing a car from Nancy to the capital, and he told us the story of a foolish woman who had just come from Paris to ask for a pass to go into a part of Alsace still held by the Germans. We had not the courage to tell him that we admired that woman's pluck.

By getting higher up the official ladder and explaining exactly what we needed, we discovered we could get possession of

one of those passes so begrudgingly issued to civilian motorists, but there was the restriction that we must make a big sweep southwards, in order to avoid a reserved and strongly fortified area, before coming northward again onto the old line of the Marne battlefield. Thus for a time we ran away from the dull boom of the heavy guns.

Curiously, the eastern portion of France right along the German frontier has been entirely free from invasion, and at that critical moment when the battle of the Marne was about to be fought the line which stretched across France almost due east and west



Graves of Von Moltke, descendant of the Franco-Prussian war hero, and of another German officer by the side of a highway near Esternay



A scene at Pargny, where the shells fell like rain during the battle of the Marne

swept upwards at its eastern end, above the great fortress of Verdun, and on coming down again beyond Nancy was mostly over the frontier line. Thus, for the motorist who wants to follow in the wake of past battles, there is nothing of interest further east. To the southeast are ruins and bombarded towns to explore.

Where Fighting Was Fiercest

It was at Thieblemont-Faremont that we struck the first indications of a great battle. The town does not cut much figure on a small scale map, but is on one of the great national highways uniting Paris with Nancy and the German frontier. It was at this eastern end of the long battle line that the fight was the most bitter and where destruction the greatest. It is declared that on a 30-mile length between Vitry-le-Francois and Bar le Duc, 50,000 civilians were left homeless. How many soldiers lie buried in the fields, or unburied in the woods, nobody has dared estimate.

Because of its convenience for exploring the surrounding country, we selected Thieblemont-Faremont as a center. According to a now out-of-date guide book, the place possessed an inn, but we did not attempt to look for it among the ruins. Instead, a village tobacco store offered to provide bed and food, and the courtyard was good enough for the car. It was more interesting here than in the big hotels,

for there were bullet holes in the ceiling to count while lying in bed, the wrecked church to examine while dressing, and the chunk of shell to inspect while waiting for the soup to be served in the sanded-floor dining room.

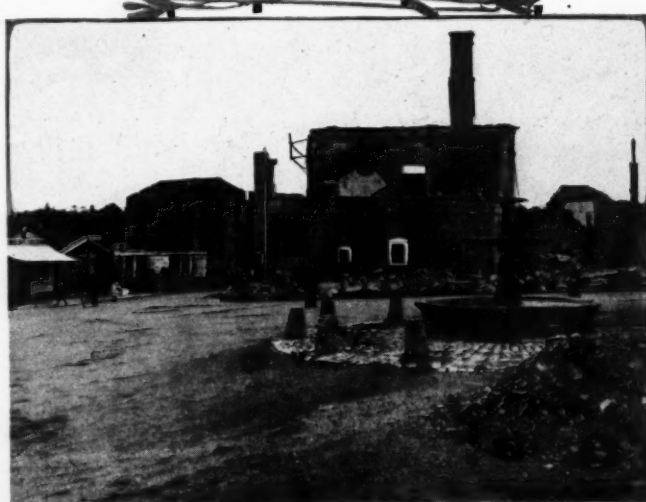
It looked as if a line had been drawn across Thieblemont-Faremont and the order given to destroy everything to the west of it and leave intact everything to the east. The village lawyer was one of those who found himself on the line. His garden wall had gone and his garage had disappeared, so the car was kept between the flower beds. If the lawyer looked east he could fold his arms and be satisfied with

the world in general; if he turned round to face westward, he would be likely to weep.

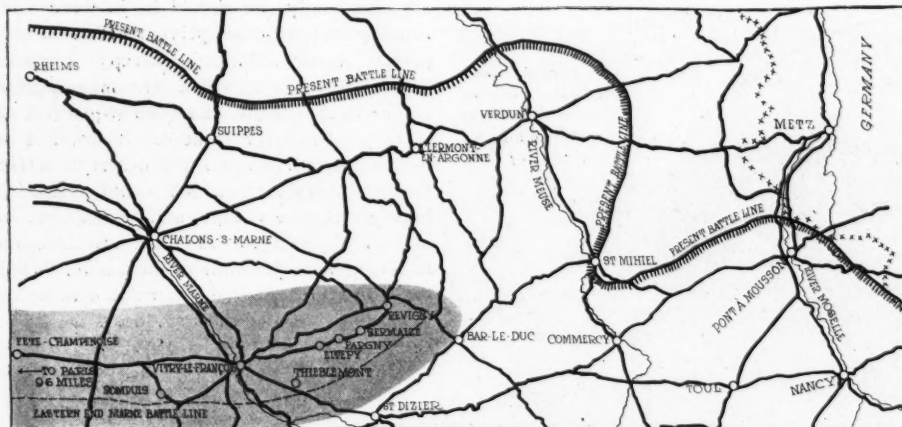
To tour modern battlefields with any intelligence it is necessary to travel far and do a lot of detail work. There are no more Waterloo plains into which two armies march in the morning and from which some of them march out at night. On the Marne front, there is a 100-mile stretch of variable depth, some portions of which can be taken at high speed and some which must be examined in detail. Between the towns of Vitry-le-Francois and Revigny is one of those detailed portions, where every inch of ground, whether it indicates it or not, has been stubbornly fought over.

Bathe in Canal

To the south of our village was the canal from the Rhine to the Marne. It was devoid of traffic and offered a good substitute for the bathrooms which never existed in the village. Eight months before it had run red with blood, for it had formed a natural obstacle to the southward march of the Germans, but nevertheless had been stoutly fought for and lost. Half a mile above the canal is the village of Ecriennes, possessing a church with one end blown away entirely, a roof that looks like a fine-mesh sieve, and a tower that is held up by ropes and props. According to the story, the Germans had quick-firing guns in the tower, the French bombarded the church, and the



Wrecked city hall in the public square at Sermaize



Eastern portion of the battlefield of the Marne and motor roads in the surrounding territory. Shaded portion shows area of severest fighting. Crosses indicate Franco-German boundary

Germans fired the village before leaving it. There is nobody to confirm the story, for the only civilian who stayed behind to watch the battle never will see another, and the soldiers who could use their legs went north to cut off the retreat of the fleeing Teutons.

The village of Vaucelerc, on the north side of the great highway, had suffered the same fate as its neighbour on the south

side of the road; the only difference was that there was less of it to destroy. On the edge of the road itself, two privates and a sergeant were putting the finishing touches to a grave in which sixty-four French soldiers and officers had been buried immediately after this portion of the Marne battle. Our visit happened to coin-

cide with that of a general commanding one of the neighboring armies, and we were able to gather that the men had been told off for this work of making suitable tombs over their fallen comrades, without being provided with funds for material. They had secured wonderful results with nothing, even to the erection of a granite column, chiseled out of a block of stone secured in a wrecked chateau. Thus were the fallen heroes honored.

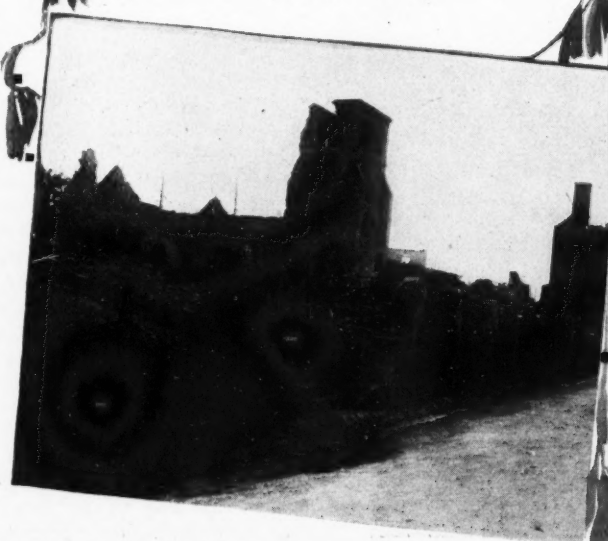
It must not be expected when touring later in France, to get much real information on the battles from the staffs of the big hotels. In most cases the people did not belong to the neighborhood, or if they did belong to the district, had gone away a safe period before the battle and come back a few weeks after it. Our lodging place was an exception. The good woman had gone away the night before the fight and come back the morning after. Staying with her was a refugee who had found herself unable to leave Chalons before the enemy took possession of it.



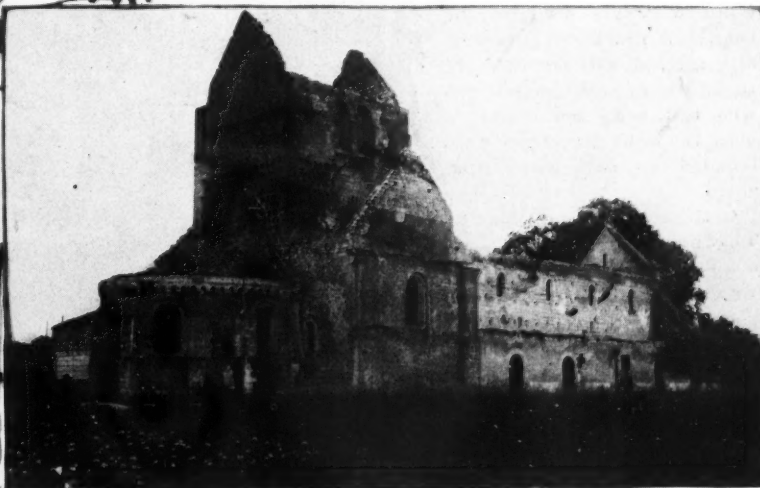
Ruins of Ecriennes church, shelled by French and fired by Germans



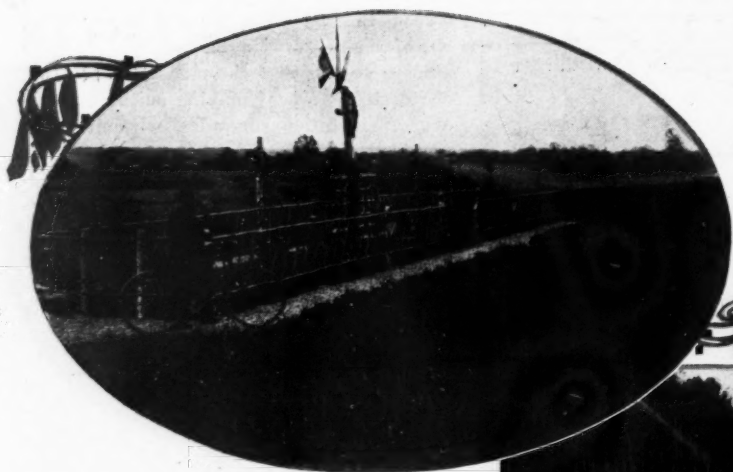
Church in Hurron, where every house was destroyed



Ruins of church at Maurupt



Sommesons church, bombarded and burned during engagements in the campaign along the valley of the Marne



French soldiers' graves near Maurupt and burial ground of 300 Germans at Esternay

"They were quite well-behaved," she explained. "Some of them got drunk, of course, and some wine cellars were pillaged, but what can you expect? Generally, they paid for what they took, and I had no reason to regret having missed the last train."

The Retreat from Chalons

After fighting to the south of Chalons, General de Castlenau advanced to take possession of it. This suggested a story of a triumphal and joyful entry, but again the reality was not in accordance with the story book accounts. "We heard strange bugle calls all over the town and noticed a great activity on the part of the troops, 40,000 of which were stationed at Chalons," said a Frenchman who had spent 20 years of his life in Strasburg and who believed that the bugle call was an order to retreat. Before the enemy all had gone, an old French reservist wandered into the Place de Ville. At the same moment a German soldier was coming out of a baker's shop with a bread load under his arm. Catching sight of the Frenchman, the German flung the rifle to the right, the loaf to the left and bolted. The Frenchman had no intention of running after him. He dragged himself to the edge of the fountain and sat there with his head in his hands. A few hours later cavalry arrived, then an infantry regiment, and all the Germans who had been too drunk to obey the order to retreat were rounded up and made prisoners.

Getting off the main road at Thieblemont-Faremont, we mapped out a morning's run with Revigny as its outermost point. Although secondary roads, they were invariably good, for since the army moved north there has been no civilian and not much military traffic in this part of France—yet the up-keep of the roads has continued just the same. The Saulx valley was soon reached and with it the village of Favresse. Here a



house was pointed out as the place where thirty French colonial troopers faced a strong force of Germans and killed 300 as they attempted to advance across the plain. When cannon was brought to bear on the house, such of the Frenchmen as remained had to beat a retreat. A French shell passed right through the schoolhouse and in the center of the blackboard a bullet lies embedded. The schoolmaster, who was present during the fight, is proud of that bullet.

If we attempted to deal with every wrecked village passed through on that

morning's trip, we should be in danger of running out of descriptive matter. Dompremy, Blesme, Pargny, Etrepy, Pargny, and many others which are meaningless names to thousands, had been wiped out as if they had never existed. Besides, it is necessary to reserve some description for Sermaize-les-Bains, which could claim to be more than a village, and which used to attract tourists to its trout streams, its baths, and its pleasant country-side. What happened to Sermaize was related to us by the proprietress of the Cafe des Allies, just

opposite what used to be the town hall. The cafe, it should be mentioned parenthetically, is a two-room wood shack, built since the battle.

Rain of Shells on Sermaize

"Nobody would believe that the Germans could get to Sermaize," she said. "There was the river to cross and the canal, and all the hills to the north. But one Sunday morning, a fine morning just like this, they began raining shells on the place. Some of the people had gone—we thought they were cowards—we who were left got into the cellars and remained there all day. When they ceased firing at 6 o'clock that Sunday evening more than 2,000 shells had fallen on Sermaize. After that we fled, and on Monday morning the Germans came in. Only half the houses had been destroyed by the bombardment, but the Germans pillaged and set fire to the others. Then the French advanced, there was fighting among the ruins, and that finished all. We have lost everything—and some of us have lost our sons, too."

To get an idea of the appearance of Sermaize, a few months after the battle, it is necessary to think of a town shaken by an earthquake, struck by a cyclone, and burned by fire. Then think that some very orderly persons have come along and removed



Gasoline engine amid ruins of a stone dwelling at Esternay

all the refuse from the roads and streets and piled it up on the particular plot to which it belongs, so that Madame Blane is almost certain that it is her wrecked sewing machine lying by the charred timbers, and not Madame Brun's Wheeler & Wilson. This tidiness of the streets and muddle of the plots form a striking contrast. The proprietor of the Hotel de la Coche, for instance, had unearthed his signboard, only slightly damaged, and had placed it on the top of his ruins, so that the visitor would know that the place had once been a well-kept hotel and not a pigsty. Even the name plates of the streets, broken and with all the paint rubbed off, had been placed in position on the heaps of rubbish. Perhaps this was done to guide the government officials who came round to estimate the amount of compensation. It is wonderful how the natives managed to recognize their own streets.

And Farming Continues

A body of English Quakers had not waited for the government to give compensation, but had set to work to build shacks, particularly for the farmers who were obliged to remain on the spot to cultivate their fields. Despite a disaster which almost passes comprehension and might have been thought of a nature to stun its victims for a lifetime, very few fields have remained uncultivated. As we sipped a soft drink outside the Cafe des Allies, one of the gray-clad Quakers came down the main road on his bicycle. At the sight



Ruins of a country house at Elrepy that will never be habited again

neighbors recovered their tongues, it was to pour forth further good advice on the necessity of always being on the spot on time.

Vitry-le-Francois is the biggest town in this district and is about 18 miles from Sermaize. Unlike the villages, the town has not suffered by reason of the war. Pillaging is hardly worth considering by the side of destruction. Yet Vitry was occupied by the Germans for 6 days. The French, who had been retreating for a week, passed through Vitry and made their way towards the south. They had hardly got out of the town when the Death's Head hussars galloped in with wild cries.

The French turned and attacked them with machine guns, causing the Germans to gallop off in disorder. This, however, did not prevent the German occupation.

If the town had nothing to show, the country to the southwest bore indelible traces of a great battle. We passed out on the main road going west, and were stopped on the outskirts of the town by a big board placed in the center of the road and having the words "Autos Arretez" painted on it. There were such boards, and in some cases chains, at the entrance to every town in or near the war area. Soldiers examined our pass and permitted us to continue. After a detour to the southwest to look at the wrecked villages of Glannes and Huiron, we sought to make a short cut back to the main road without passing through Sompuis.

It was soon evident the side track we had got on was not intended for motor traffic. However, as turning was difficult, we continued in the hope of forcing a passage through. Suddenly we ran into a big farm, where soldiers were washing.

"We have got lost; can you direct us to the main road?" we inquired.

"Have you got a pass to travel through here?" queried the sergeant.

Valuable Flimsy

We presented two flimsy, but valuable bits of paper covered with official seals and bearing our respective photographs. After reading them through carefully, the soldier handed them back with the remark:

"You are all right; we can have a drink here."

In the big, old-fashioned kitchen a bottle of white wine was uncorked and glasses raised to the success of the allies.

"Where are we?" we asked.

"This is the Ferme des Hirondelles, near La Certine, the bloodiest portion of the battlefield."

It was meagre information, and no more details were available, for all the men were strangers to the district and they did not possess a map. However, a soldier who was described as a native, although he came from above Rheims, 40 miles



of him, a Frenchman rushed out of the shack and hailed him boisterously:

"Hi, you, the English."

The Englishman dismounted deliberately and speaking slowly and seriously said:

"It is too late; I gave you a rendezvous in front of your plot; I waited half an hour and you did not come. I must suppose that you do not want me to rebuild your house. It is too late now; I am very busy."

It was a lesson in exactitude which left the Frenchman dumbfounded. When the

Two views of Thieblemont Faremont, half of which was wiped out and the other half untouched



away, was brought forward to give us all necessary instructions. The soldier suggested that we might pay a visit to the nearby battlefield, and the consent of the sergeant having been obtained, we set out afoot.

After crossing a deep valley, we began to climb a pine-clad hill along a track possible only for men and mule teams. From time to time bits of military equipment were found: a leather belt, harness, a broken rifle, etc. A German tunic, lying by the side of the track, drew out attention. The soldier turned it over and noticed that the lining was stained with blood.

"Poor devil," one of us remarked, "he probably died in the woods."

"Well, he had only to stay at home; we never asked him to come into France," replied the soldier, abruptly.

Reaching the top of the hill we found ourselves on a plateau which had been almost untouched since the fight which the Frenchmen described as the bloodiest in the battle of the Marne. The dead had been put under a shallow layer of earth,



Wood shack built by English Quakers immediately after the battle of the Marne in Favresse

the grounds in hundreds. They were singly, or in groups of two, three or six. The trees were hacked and slashed and at places where the fire had been concentrated, paths had been cut in the woods. From time to time, large shell holes were encountered, as well as chunks of what were doubtless 155-millimetre shells.

After the bombardment, there had been a fierce bayonet charge, in which some of the French had fallen. Their graves stuck

sad and grim on that wild plateau. Mostly they were unidentified men, as the words,

"Soldats inconnus," written on the rough cross, indicated. Their torn kepis indicated to which they had belonged.

"Across there to the southeast is La Certine farm," explained the soldier. "It was the hottest point in the bayonet charge. When we cleaned up the ground we found two pairs had bayoneted one another; each man

was standing dead with his enemy's bayonet through his body. At this spot we buried 600 Germans on a length of 300 yards. They had evidently come out of the wood for a bayonet attack and our guns had caught them as soon as they got into the open. The undergrowth being thick, they could not get back quickly and every man must have perished."

Found a Heap of Equipment

We moved to the far side of a little thicket to find there a great heap of German equipment: greatcoats riddled with bullets, a pair of rubber braces cut through by a piece of shell; knapsacks with the hair left on them; medical bandages, torn trousers, broken rifles, cans, belts, water bottles and an immense quantity of heavy iron-heeled army boots of the kind made only in Germany. One pair of boots was partly buried, merely the toes sticking out. As I was idly kicking the earth away, the soldier said:

"You had better not do that; somebody's feet are in those boots."

Before we left him, the soldier gave us his address, a little village north of



but the plateau was in too wild a country and too far removed from all lines of communication for any of the cleaning up to have taken place, as on other parts of the battlefield. The plateau on which we stood had been held by the Germans and formed a naturally strong position. A few miles to the south, across wild undulating country studded with numerous pine woods, the French had been in position. The German trenches had not been touched since they were abandoned by their occupants and were surrounded by all the refuse attending a body of men in the field. The heights had been heavily bombarded, for exploded French 75-millimetre shells lay on



At Vitry en Perthois, a line of chimneys show where cottages once stood. Maupert, once a prosperous town, does not possess a single whole house

Rheims, where he cultivated vines in peaceful times. He assured us of a welcome if we came through that place after the Germans had been driven out.

With our bearings secured, we ran through Sompuis, then on to the main highway running east and west between Paris and Nancy. Although this was one of the main roads leading up to the battle front, there was surprisingly little traffic. During a week on the road we never saw a private car. Sometimes a whole day would



Upper illustration—A view of Sernaize, showing wreckage of hotel on right and temporary town hall, built since the battle, on left. Lower illustration—The cottage chimneys at Gannes refused to fall when the walls came tumbling down

pass with only two or three cars being encountered. These would be officers' touring cars driven at high speed, or maybe a light truck towing a dismantled aeroplane on a two-wheel float. On another day it would change and a convoy of several hundred trucks would go by. This was an indication that troops were changing positions. After this the roads might again remain deserted for weeks.

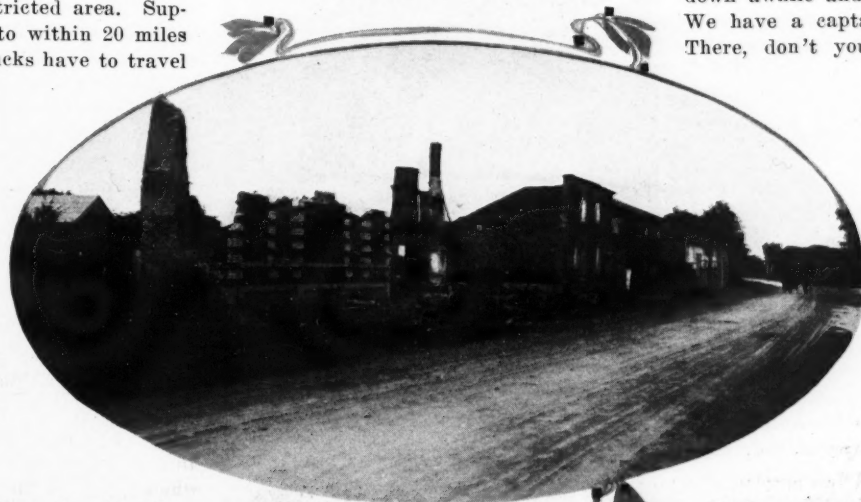
Restricted Area for Cars

With a fixed battle front, the war cars work within a very restricted area. Supplies are sent by train to within 20 miles of the firing line and trucks have to travel from these points to the neighborhood of the trenches. Everything back of this 20-mile strip is so quiet that were it not for the constant booming of the guns, it would be impossible to believe that a war, or indeed any martial activities, were in progress.

Where the main road east and west was cut by the great highway lying north and south, with Châlons and the battle front at the northern end, we put in for lunch. The village was Sommesous, a place not likely to attract

the attention of the motorist in ordinary times. When the lunch was disposed of, a run through the village naturally suggested itself. The wreckage was much greater than appeared from the main road; indeed, with the exception of the railroad station, there was not much that had escaped destruction. By the side of the wrecked church we got in conversation with a lad who was doing a man's work.

"I suppose you beat it when the Germans were coming?" we remarked.



View of wrecked Thiebemont Faremont on the excellent national highway between Paris and Nancy

"What do you think; we came back in time to do the cleaning up. The engineers had been in before us, but they left us plenty of work burying the dead and the bodies that had not been put down deep enough. We have a lieutenant-colonel here."

He led us into a field and pointed out the grave of the French officer about a couple of feet from the church railings.

"He was in a motor car down that lane when he was killed by a shell. The driver was injured, too, but another officer brought the car back. The driver died in the village."

German Graves Unmarked

"Are no Germans buried here?" we asked. "We never see their graves."

"Oh, there are plenty, but nobody ever thinks to mark them. There was one in that field who came up after he had been down awhile and the crows ate his head. We have a captain in our potato patch. There, don't you see, under that stick, where the potatoes are rather withered."

He noticed our grimace.

"Bah," he exclaimed, "the potatoes are good enough for the pigs."

He left us and a few seconds later was shouting across the field to one of his mates: "Jean, the stranger with the motor car has taken my picture—true."

National Highway No. 34, from Sommesous to Esternay, might be designated "the bloody road." Both the French and the Germans were a little to the south of

it when General French sent out the order last September for the advance which was to produce the great victory of the Marne. As they stood to the impetuous French attack, the Germans made a determined stand on the road itself. Even 8 months after the fight, the German dug-outs can be seen in the southern ditch, varying in intervals from a few inches to a few yards. And they continue for mile upon mile. On the north side of the road there is no such cover, but instead, clearings where the French guns were placed, for when the Germans were driven from the south side of the road they retreated right across and took up positions in the various woods.

Eight Months After the Battle

Again and again we left the car by the roadside and wandered into the woods to note the positions of the trenches and follow the phases of the battle. Although this is one of the most important highways in France and in peace times carries a large amount of traffic, exploded shells were plentiful in the ditches 8 months after the

fight. For several miles to the north of this road, the country is one vast battlefield. In this district is the St. Gond marshes, across which the German armies had to retreat with most disastrous results. At whatever point the country is entered, there is the devastation of war for a depth of 20 miles. After that the German retreat became more decided and fewer traces are to be found of the passage of the armies.

Fere-Champenoise stands out as the place where the German troops went mad with drink. They had been wonderfully successful in their southward march, and when this little town with a big brewery was selected as a billeting place, there was no restriction on drink allowances. There are stories of wild outrages, men dancing drunken dances around a piano in the streets, and into the midst of it a savage bayonet attack. All the souvenirs of the war are to be found in the cemetery. The same applies to the next town, Sezanne, which had fighting all around it.

It was outside Esternay that the battle appeared to have been particularly severe. On a hill overlooking the town, a well-kept grave on the south side of the highway contained the bodies of forty-three French soldiers who had fallen in the fight. On the opposite side of the road, 100 yards away, was one of the few German graves we encountered on our trip. Under a mound marked out by rough stakes and galvanized iron wire, 300 Germans were buried. In the same field were other graves containing from one to six men. Apart from the rest, but marked out with the same rough stakes, was a mound with a couple of unpainted crosses planted on it. On the crosses of the grave we read the words: "Von de Moltke" and "Officer Allemand."

From this grim sight to the little town of Esternay was a wonderful change. An open air market was established in the village square and the place was so crowded that it was difficult to pass in with a motor car.

Tourists Eager to Enter Yellowstone at Park Opening

White Car Carrying Government Officials on Test Trip Leads Way Through Gate at Gardiner—1,188 in First 10 Days

MAMMOTH HOT SPRINGS, Yellowstone National Park, Wyo., Aug. 10.—Special Telegram—On completion of 10 days of motor travel in Yellowstone park, a total of 151 cars and 597 tourists have entered from the west side, 86 cars and 311 tourists from the north side, 83 cars and 280 tourists from the east entrance and one car and three tourists from the southern entrance. This is a grand total of 320 cars and 1,188 tourists. There have been no accidents; schedules are working splendidly, and everybody is pleased with them.—Colonel L. M. Brett, Acting Superintendent, Yellowstone National Park.

GARDINER, Mont., Aug. 6—Years of agitation to admit motor cars to Yellowstone National park culminated in success on the evening of July 31, when government and park officials in a White touring car rode through the park on a preliminary trip, officially signifying that the great American playground was open to motorists for the first time. Originally, it was planned to open the park after midnight of July 31, but this was changed to permit entry early in the evening, so that tourists could make the 6-mile trip from Gardiner to Mammoth Hot Springs hotel in daylight, and be ready to start through the park from the hotel on Sunday morning, August 1.

Long before the hour of opening, the roads to Gardiner were aswarm with cars carrying tourists who had timed their trip so as to be on hand for the big event. Many who last year had made a pilgrimage to the park entrance with cars bearing the slogan, "Let Us In," were there to see the results that they had helped to gain, and enthusiastic to be among the first to cross the heretofore forbidden line.

As the opening hour approached, the number of waiting cars grew steadily, and, with the hum of voices and the eagerness of the tourists to get through the entrance arch, the scene took on the appearance of a great carnival.

It seemed, as one passed among the throng of cars, that every state in the

union had sent its quota of motorists to show their appreciation of this latest opportunity to view world's wonders from the comfortable seats of their own motor cars.

Promptly at 6 p. m. on Saturday, the official car, a White, carrying Colonel Lloyd M. Brett, U. S. A., superintendent of Yellowstone National park; Major Amos A. Fries, U. S. A., chief of park engineers, and H. W. Childs, president of the Yellowstone Park hotel and Yellowstone Park Transportation companies, passed under the imposing entrance arch, amid a din of cheering, mingled with the noise of horns of all descriptions, and Yellowstone park had joined the rest of Uncle Sam's beauty spots in welcoming the gasoline steed on equal terms with the time-honored horse-drawn stage.

Other cars in the waiting line were admitted a short time later, and the eager tourists had their first glimpse of the greater wonders in store ahead. The 6-mile road from the park entrance at Gardiner to Mammoth Hot Springs follows a winding path which passes between towering cliffs and rugged hills, and crosses and recrosses a foaming trout stream which parallels the road. All during the evening, motorists kept arriving at the hotel, to be ready to start the tour on the following morning.



WHITE OFFICIAL CAR ENTERING YELLOWSTONE

Bright and early Sunday morning the train of motor cars started from the broad white entrance of Mammoth Hot Springs hotel on the first tour of Yellowstone ever made by motor cars. The White, which was designated as the official car to carry the government and park officials, led the procession of motor cars over the entire route through the park.

The first unofficial car to enter at Gardiner was a Ford runabout, driven by K. R. Seiler, of Red Wing, Minn.

At Other Gates

Cody, Wyo., Aug. 6—W. H. Derbyshire, who had braved all kinds of inclement weather since he left Philadelphia in his Hudson, claims the honor of having been the first to enter Yellowstone park at the eastern gate. Despite torrents of rain, nine cars followed on the first schedule of the opening day.

Billings, Mont., Aug. 6—The first automobile to reach this city after touring the park was driven by Dr. C. A. Hanvey, of Jamestown, N. Y. He was very enthusiastic over road conditions in the park. He made the entire trip through the park in 3 days. He stated the park officials were very courteous in their treatment and added that the rules for motor traffic were very liberal.

DETAILS OF SUN SIX

Buffalo, N. Y., Aug. 9—Specifications of the Sun six, which was recently announced, have just been made public. The motor is of L-head design, with six cylinders 3 by 5 inches. Both the intake manifold and the hot-air connection are cast integral with the cylinder casting. In accordance with the tendencies in European cordance with the tendencies in European design, all reciprocating parts have been made very light, which permits the motor to operate at high speed without any undue vibration.

The cars will be finished in only one color—Brewster green body, hood and

fenders, with black running gear. A roadster and a five-passenger touring car will be furnished on the same chassis and the price will be considerably less than \$1,000. The car is built by the Sun Motor Car Co., recently organized in Buffalo, N. Y.

MONITOR EIGHT AND FOUR

Columbus, Ohio, Aug. 9—Two cars, an eight and a four, have been put out by the Cummins Auto Sales Co., under the names of the Monitor 8 and the Monitor 4-30. The eight is listed at \$1,075 and 4-30 at \$795. The motor of the eight is a Golden, Belknap and Swatz unit with its cylinders cast in two blocks at 90 degrees and having a bore of 3¼ inches.

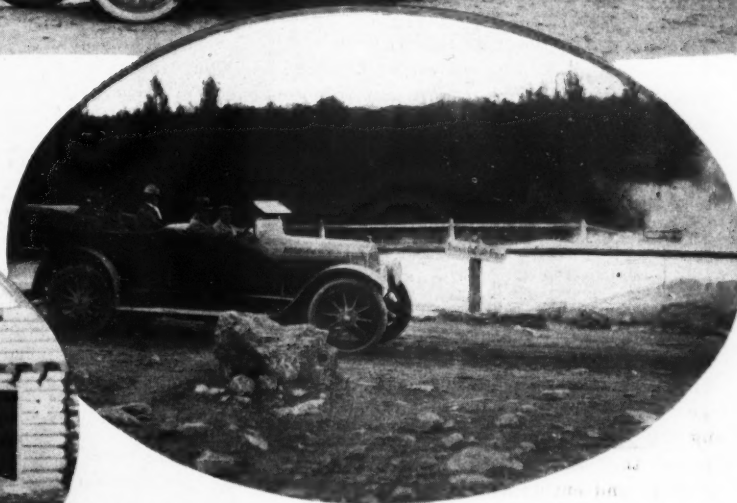
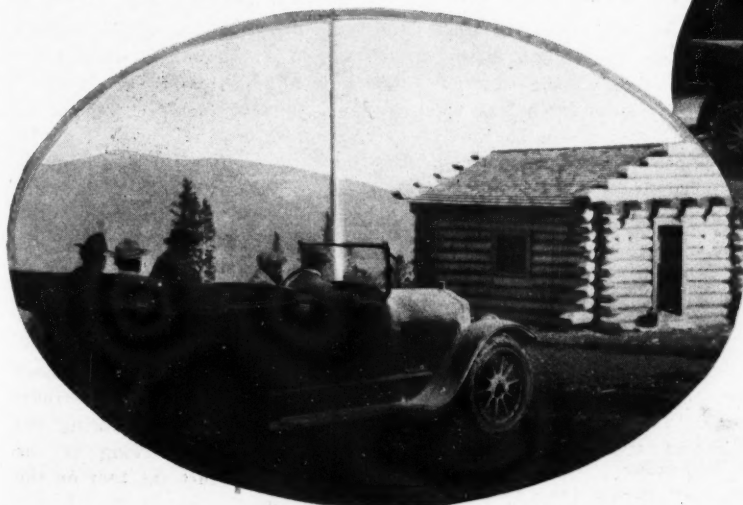
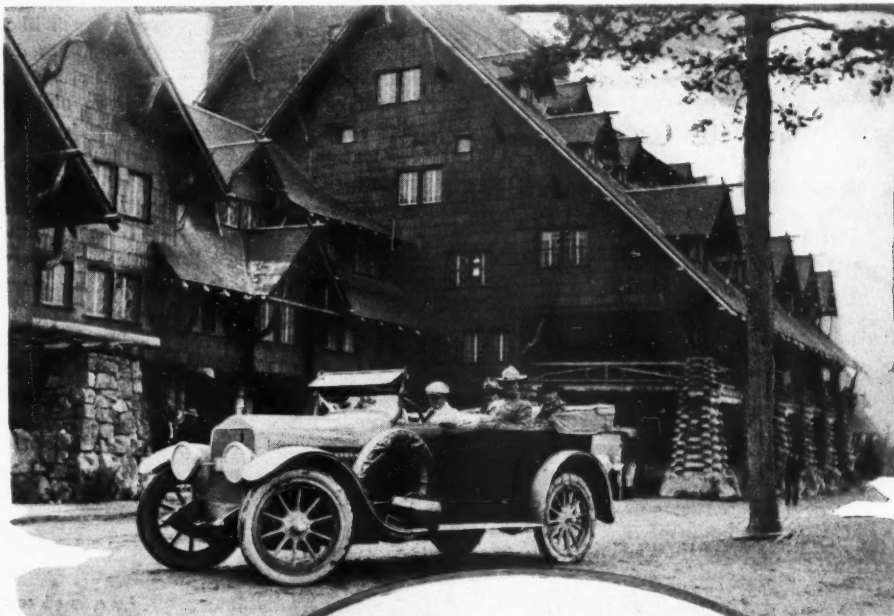
This motor has a single camshaft and is

oiled by a combined pressure and splash system. The drive is through a multiple-disk clutch to a three-speed selective gearset, then through a driveshaft fitted with two Spicer universal joints to a Timken rear axle. The wheels have 33 by 4 tires and the springs three-quarter elliptic. The body is a five-passenger design equipped with a mohair top and jiffy curtains. Gasoline feed is by the Stewart vacuum system.

The Monitor 4-30 has its four cylinder L-head 3¾ by 4¼ motor cast in a block. It has a unit power plant with three-point suspension including a multiple-disk clutch, and three-speed gearset. The drive is by shaft, the propulsion being taken through a torsion tube. The rear axle is floating and the wheels 32 by 3½. The gasoline tank is carried in the cowl. The wheelbase of this car is 108 inches, being 4 inches shorter than the eight. Electric lighting and starting are included on both these cars.


NEXT WEEK

"Motoring in Wonderland," the feature of next week's Motor Age, is a graphic picture of a trip taken in one of the first cars to enter Yellowstone Park.



A TRIO OF SCENES IN YELLOWSTONE NATIONAL PARK

Top—White car, that made initial trip through America's national playground the evening before the formal opening to motor vehicles, in front of Mammoth Hot Springs Hotel. Bottom—View of mammoth paint pots. Left—Motor car checking station at Washburn



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100-Mile Races

FUTURE success of 100-mile challenge speedway races will depend largely on whether the contesting cars are evenly matched or not. If one car has more speed than the others the interest centers on whether tire troubles will be the determining factor. While speeds of over 100 miles per hour are spectacular on paper they are not nearly so thrilling from the grandstand, and competition at such speed depends for its interest on evenly matched cars, just as it does at speeds of 50 or 60 miles. The foot race for 100 yards is short and filled with interest only in proportion as the spectators see real competition, in which closely-matched rivals are contending.

WITH the present speedway circuit it is possible to have many 100-mile challenge races but in these it will be impossible to have cars all evenly matched. Then other factors must be introduced to hold the interest and maintain public attention. Instead of simply paying drivers to drive in such contests it would be immeasurably better to post cash prizes. Instead of giving the total purse to the winner, why not give cash to the leader at each lap? If \$10,000 is to be given for the race you can divide this into two parts: Part one of \$5,000 could be divided into \$100 prizes to the car leading at the end of each of the fifty laps. Public interest would be stimulated and it would prevent that listless trailing of one car after another for lap after lap. Such cash prizes at the end of each lap would unquestionably result in a series of sprints, and there would be the added advantage that the spectators, being aware of such a scheme of awarding cash, would carry out the mathematics of the victor and by the end of the race would know exactly what each contestant had won. This would add to the interest in the race and by so doing would be a potent factor in maintaining interest.

PART two of the prize money, namely, \$5,000, would be divided among all of the starters or finishers, according to the promoter. The feeling is general that with many drivers appearance money must be given, or expenses paid. Unfortunately, this practise has been very seriously abused. It has not helped the good name of the sport and if the abuse continues to grow it will within the near future injure the speedway sport. If some manner of paying a part of the drivers' expenses has to be evolved there is one way to handle it, namely, giving the same to all, so that each entrant goes in on the same ground. Some promoters think they have to give appearance money in order to get entries. This will accomplish results for a while, but will eventually fail, just as in aviation.

Selling Accessories

DID you ever walk into a drug store to buy a pound box of chocolates, look around to see if a shelf in a show case were given over to candies and, not seeing such, decide to walk out again, feeling quite settled in your own mind that that drug store did not handle candies?

Perhaps before walking out you asked the druggist to make sure and convince your own self. Supposing that druggist should answer: "Yes, we carry chocolates," and instead of going to a show case for them should go into his little back room and bring out a kind of dirty box of candies. Would you feel very much like buying them? Rather would you not be thinking, "Well, this druggist certainly cannot sell many or he would have them in his store, and perhaps the box I am getting is a month or two old." The net result would be that you would go out of that store feeling quite positive deep down in your own heart that you were getting a poor bargain.

NOW, if you are a motor car dealer or a garageman, turn to your own store and ask if you are selling motor car supplies and accessories in just about the same way as the druggist is selling candies. Are you really in the accessory business, or rather do you carry a few accessories on some shelf in some hidden place, where nobody would have a chance of seeing them? If you are selling accessories in this way it is time you took a lesson from the up-to-date druggist, who has a separate show case for candies and another show case for cigars. Get your accessories out where the public can see them. Let every one who enters your store be immediately convinced by the arrangement of your place that you sell accessories.

THERE is money to be made in selling accessories. That is to the motor car dealer and also in the garageman selling them. There is so much money in the movement that the hardware interests are awaking to the broad possibilities and are conducting a campaign to have more of their people sell motor car accessories. They try to argue that the hardware store is the proper place to buy a motor car supply or part. Ask yourself where you would sooner buy a spark plug. You stop over night at Spotless Town garage and it is 6 o'clock when you arrive. Hardware stores are closed but you need a new plug. Would you not sooner buy it at the garage where you are stopping? Everybody would, but so many garagemen have not yet awakened to this fact. The garageman and the motor car dealer have been letting hundreds of thousands of dollars slip away from them annually.

101.86 Miles per Hour

AT LAST a race has been won in America at a speed of over 100 miles per hour, Resta, the Italian driver, in the Peugeot car, attaining this distinction at the Chicago 2-mile board speedway last Saturday. Americans for a long time have looked forward to the time when races would be won at over 100 miles per hour. That wish has at last been granted. Now the pace will rise and we will look forward to the time when a race will be won at 110, 120 and perhaps 150 miles per hour.

AMERICA for the first time has seen more than 100 miles crowded into 1 hour of competition. Such speeds are stupendous, but on the modern track the sensation to the spectator is not so engrossing as might be expected. We soon grow accustomed to increased speeds. The last 10 years has witnessed competition rise from 50 to over 100 miles per hour, but the end is not yet, and it is not surprising if in the next 10 years we see the pace rise to as high as 150 miles per hour on American speedways.

Motor Car and Truck Exports are Doubled in a Year

Value for 12 Months Ending June, 1915, Totaled \$60,254,635—June Power Wagon Shipments Jumped from 90 in 1914 to 2,990 this Year

WASHINGTON, D. C., Aug. 9—Exports of motor cars from the United States for June, 1915, were larger than for any one month since the beginning of the industry, which shows a remarkable recovery of the foreign trade in passenger vehicles following its demoralization last fall. This figure marked the second time since the beginning of the European war a year ago that exports of passenger cars have shown an increase both in number and valuation.

Figures for 12 months ended June, 1915, show that the value of motor car exports for the 12 months is more than double that of the preceding fiscal year. A comparison of the figures for the 12 months' period ending last June with those for the corresponding period ending in June, 1914, shows some interesting facts concerning

the exports of passenger cars and motor trucks, as follows:

	1914		1915	
	No.	Value	No.	Value
Commercial	784	\$ 1,181,611	13,996	\$39,140,682
Passenger	28,306	25,392,963	23,880	21,113,953
Total	29,090	\$26,574,574	37,876	\$60,254,635

From the foregoing it will be seen that commercial cars exported during the 12 months' period increased in number more than 1,500 per cent, while in value they increased more than 3,300 per cent. The phenomenal development of motor truck exports, which began last September, still continues, the shipments last June nearly doubling in value the foreign shipments of

passenger cars. Export figures for June, 1914 and 1915, as given by the department of commerce, are:

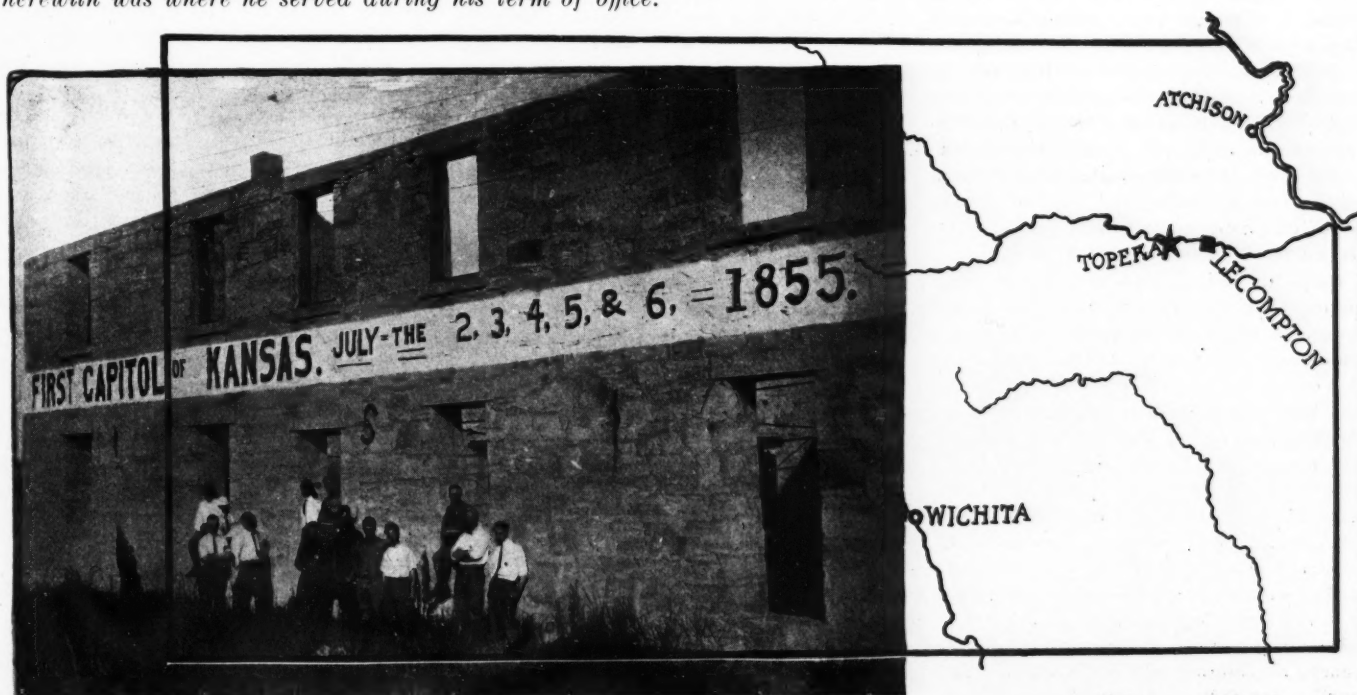
	June, 1914		June, 1915	
	No.	Value	No.	Value
Commercial	90	\$ 120,257	2,990	\$ 8,578,802
Passenger	1,982	1,870,882	4,418	4,785,998
Total	2,072	\$ 1,991,139	7,408	\$13,364,800

The June, 1915, exports of parts, not including engines and tires, amounted to \$1,139,183, while during the last fiscal year these exports reached a total of \$7,853,183. Turning to last year's figures it is found that in June a year ago \$473,968 worth of parts were exported, while during the fiscal year ending June 30, 1914, exports valued at \$6,624,232, were sent abroad.

See America First — See America Now

EDITOR'S NOTE—This is the thirty-eighth of a series of illustrations and thumb-nail sketches of scenic and historic wonders of America to be published in Motor Age for the purpose of calling attention of motorists to the picturesque points of interest in their own country.

MOTORISTS crossing Kansas via the Red Line route will find the old structure that served as the state's first capitol at Lecompton, 15 miles east of Topeka, the present capital. Back in the days when smouldering fires of strife between the anti-slavery and pro-slavery factions burst forth in all their fury—afterward looked upon as the climax that brought on the 4-year struggle between the north and south—Kansas was the scene of many heated discussions and unlike present-day methods, legislators from other states campaigned in Kansas both for and against slavery. The first territorial government was set up in the sunflower state in 1855, following its admission as a territory through the Kansas-Nebraska act signed by President Franklin Pierce. It was on Kansas soil that the first battle was fought for the freedom of the negro and it was Kansas that developed the heroic John Brown. Andred H. Reeder, of Pennsylvania, was appointed the first territorial governor and the old building shown herewith was where he served during his term of office.



No. 38—FIRST CAPITOL OF KANSAS AT LECOMPTON, WHICH HOUSED THE GOVERNMENT FROM 1855 to 1859

Ralph Mulford Wins at Des Moines

Drives Duesenberg in First Race on Hawkeye Speedway
at 87 M. P. H.—De Palma Second in Stutz



RALPH MULFORD, WINNER OF DES MOINES RACE

By Bert N. Mills

DES MOINES, Ia., August 7—Ralph Mulford, driving one of the three Duesenbergs, captured first honors in yesterday's 300-mile race, which dedicated the local 1-mile speedway and cost the lives of Joe Cooper, pilot of the Sebring, and Morris Keiler, mechanic for Billy Chandler. Chandler, another of the Duesenberg drivers, and Louis Perio, who pumped oil for Cooper, also were injured in the two accidents that resulted in the death of Cooper and Keiler.

De Palma Claimed Winner First

Ralph de Palma, who switched his allegiance from the German Mercedes to the American Stutz for yesterday's race, was announced unofficially as the winner at the conclusion of the contest, but after the timers and scorers' sheets were rechecked last night, Mulford was awarded first money. De Palma was placed second and O'Donnell, Mulford's teammate, third. Mulford covered the 300 miles in 3 hours, 27 minutes, 53.5 seconds, averaged 87 miles an hour for the three centuries and on the corrected times, had an advantage of 1 minute, 7 seconds over the Stutz.

Five other starters finished inside the money, as follows: Brown's duChesneau, fourth; Barndollar's Clergy Special, fifth; Henderson's Cooling Special, sixth;

Strunk's White Special, seventh, and Tom Alley's Ogren, eighth.

Scott, driver of the Anderson Special, was eliminated near the close of the race when his car developed engine trouble.

Keeping out of the pits was what won for Mulford and getting into them was what beat de Palma. Mulford went more than the last 100 miles of the grind without a single hesitation in his sweep to a thrilling victory and went to the pits only three times in the entire race. Mulford and de Palma were neck and neck on the same lap in the two hundred and ninety-seventh mile, when tire trouble stopped de Palma for the seventh time in the contest and cost him a victory which then seemed almost in his grasp.

Set Pace of 90 M. P. H.

Joe Cooper was killed near the end of his thirty-ninth mile. He was in second place and close on de Palma's Stutz. Both cars were going better than 90 miles an hour, when at the end of the turn into the home stretch the Sebring's left rear tire blew out. The treads on this tire had been worn off two laps earlier. When the tire blew, the rear end of the machine swerved and skidded toward the inside of the oval. The car was almost at right angles with the track. Cooper fought desperately to hold it to the course and did succeed in keeping it from the inside of the saucer, only to have it skid a distance of 30 feet directly into the outer rail. This crumpled like tissue paper as car and riders went through it.

Billy Chandler met his disaster early in his two hundred and thirty-ninth lap, when he was going strong in fourth place. He says the breaking of his left rear wheel was the cause. The car skidded halfway up the saucer on the back turn, leaped into the air, turned completely over, and hurdling over the inside dirt track, plunged through the guard fence. It landed over 50 feet from the course.

Drivers do not blame the track for the two deaths. After the race, de Palma said: "The track is all right. It is one of the best and safest I ever raced over." O'Donnell said neither of the accidents was caused by the track construction.

Pit calls determined the race. These mostly were for tire trouble up to the 200-mile mark. After that it was motor trouble, except in the case of the three leaders. Most motors apparently were balking at the terrific strain. With O'Donnell leading de Palma half a lap in the two hundred and twentieth mile, both cars went into the pits for tire trouble and staged one of the best contests of the day. O'Donnell was in first and out first, but de Palma's pit work had cut down

O'Donnell's lead to such a narrow margin that the Stutz leaped in the lead early in the two hundred and twenty-first lap. Mulford was close behind on the same lap and the three cars then fought together almost neck and neck until the close of the race.

After a preliminary lap with the cars 20 seconds apart and de Palma and Cooper leading, Starter Edwards gave the field the white flag at 1:30 o'clock. Cooper, de Palma, O'Donnell and Chandler were bunched in the lead. Engine trouble put Lombardi and his O'Donnell special out at the end of the eighth lap. De Palma, Cooper and O'Donnell gradually pulled away from Chandler in the first fifteen laps. O'Donnell went ahead of de Palma in the thirty-sixth lap, when tire trouble sent the Stutz to the pit. Shrunk and his White special were first to the pit in the thirty-second lap. Chandler went in on tire trouble in his thirty-third. With Cooper out in the thirty-ninth, O'Donnell continued to hold his lead over de Palma and was out in front at the 50-mile mark. He held a one-lap lead over the Stutz until the sixtieth mile and on account of Stutz tire troubles had increased the lead over de Palma to three laps at the eightieth mile. Mulford then was one lap behind de Palma, and Tom Alley, in his Ogren, was a lap behind Mulford.

A left rear tire forced O'Donnell to the pits for the first time at the end of his ninety-second lap. Mulford then passed him, but de Palma, handicapped by still another trip to the pits because of failing tires, was still astern both Mulford and O'Donnell when Mulford registered 100 miles with O'Donnell 98 and de Palma 96. De Palma's fourth tire went wrong in the ninety-eighth lap. The time for the first 100 miles was 1 hour, 7 minutes and 6 seconds, or at the rate of 88.6 miles per hour. Mulford won \$100 extra prize money for leading at the 100-mile mark.

Mulford Stops at the Pits

Mulford's first trip to the pits was in the one hundred and fifth mile, when he made a quick change of tires and kept his lead. O'Donnell was a lap behind him at the 125-mile mark and de Palma was still 4 miles behind. O'Donnell went to the pits for a new tire in the one hundred and twenty-fourth lap. Mulford continued to pile up his lead to the 150-mile mark, when he was 4 miles ahead of O'Donnell and 7 miles ahead of de Palma, but a tire change sent Mulford to the pits in his one hundred and fifty-seventh lap and lost him his lead.

O'Donnell led at the 200-mile mark and took down \$100 extra money. The time for the distance was 2 hours, 19 minutes,

OFFICIAL TIME OF EACH CAR EVERY 40 MILES IN DES MOINES SPEEDWAY RACE

No.	CAR	DRIVER	MILES							
			20	60	100	140	180	220	260	300
1	Stutz.....	De Palma....	13:15.09	40:30.52	1:11:44.21	1:38:57.14	2:05:42.43	2:32:20.45	3:00:05.51	3:28:12.02
2	Sebring.....	Cooper.....	13:20.57	Wrecked 39th mile.						
3	Duesenberg...	O'Donnell....	13:19.68	39:11.86	1:08:02.52	1:36:43.52	2:03:20.61	2:30:25.27	2:59:24.51	3:31:45.51
4	Duesenberg...	Chandler.....	13:55.69	44:13.80	1:15:16.40	1:47:05.49	2:18:55.48	2:50:02.41	Wrecked 239th mile.	
6	Duesenberg...	Mulford.....	13:30.35	40:10.00	1:07:06.94	1:35:27.76	2:05:03.51	2:33:40.90	3:00:24.59	3:27:05.33
7	Ogren.....	Alley.....	14:01.39	41:57.35	1:15:06.52	1:46:17.82	2:15:32.09	3:17:30.71	4:21:33.27	5:10:13.08
8	White Spl....	Shrunk.....	13:57.01	1:26:17.52	1:53:54.83	2:36:36.28	3:23:41.51	4:11:58.57	4:40:33.85	5:09:54.13
10	Du Chesneau.	Brown.....	15:58.75	49:01.02	1:22:01.55	1:56:61.52	2:28:54.01	3:06:24.49	3:51:38.91	4:26:22.18
12	Duesenberg...	Henderson....	14:53.36	47:46.38	1:28:07.27	2:09:01.03	2:48:30.59	3:25:30.39	4:24:10.50	5:01:43.25
14	Anderson Spl.	Scott.....	16:58.00	52:43.26	1:31:19.62	2:20:02.40	3:39:02.52	4:14:47.95	4:54:22.41	Out
16	Clergy Spl....	Barndollar....	17:22.15	1:00:31.47	1:34:10.00	2:11:23.28	2:47:48.55	3:26:55.51	4:03:45.18	4:40:35.02

36 seconds, and the average was 86 miles per hour. De Palma was second and Mulford third. De Palma was only a lap behind and Mulford had fallen back four laps. At the end of the two hundred and thirteenth mile, de Palma had gained half a lap on O'Donnell and continued to gain gradually until the two hundred and twentieth lap, when both went to the pits together, with O'Donnell out a little ahead, but de Palma jumping out in front again for the first time in many miles. The two were closely trailed by Mulford, fighting in the same lap, and the three cars, beautifully and skillfully driven, staged a wonderful race, with no decided advantage to any one of them until the two hundred and sixty-ninth lap, when O'Donnell blew out a tire.

De Palma was leading when O'Donnell

JOE COOPER

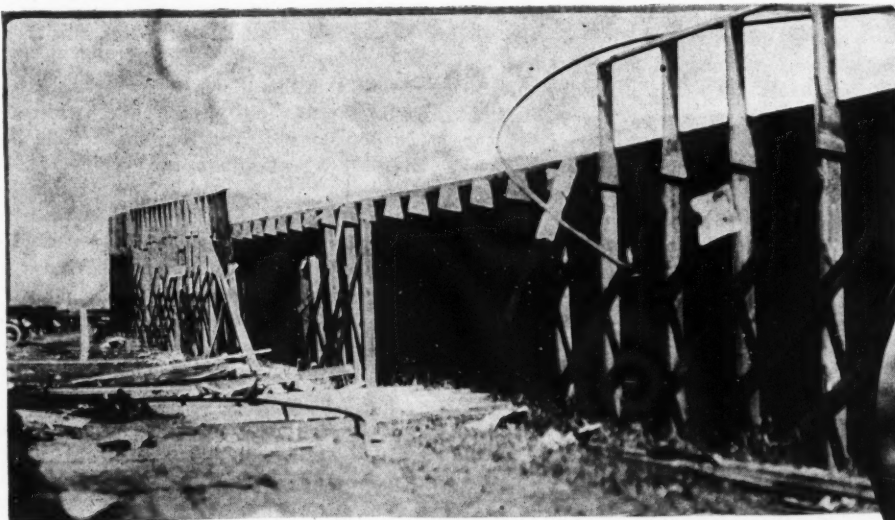
JOE COOPER, who lost his life when his car ran wild on the Des Moines' speedway Saturday and turned turtle, first gained national fame in the 500-mile events at Indianapolis and Chicago this year. He drove his Sebring in both of these contests, failing to finish the Hoosier classic, but taking tenth money at Chicago.

Before this year, Cooper confined his speed activities to dirt track meets in Ohio. He was a resident of Youngstown, but moved to Sebring to assist in building the car in which he rode to his death.

went to the pits for tire trouble in the two hundred and sixty-ninth lap. Mulford was close behind. It was then a great race between those two. De Palma held the lead until the two hundred and eighty-ninth mile, when Mulford nosed ahead by a wheelbase. The two cars fought grimly on together mile after mile. De Palma took the lead again in the two hundred and ninety-fourth mile.

De Palma then blew another tire in his two hundred and ninety-seventh lap. He had only two more miles to go for victory and holding the pace he was making, the chances against him seemed small. But the tire trouble lost him the race. His change was made like lightning, but Mulford, had flashed by him when his tire went bad on the home stretch turn.

Mulford's time was 3 hours, 27 minutes, 53.5 seconds, and de Palma's was 3 hours, 28 minutes, 12.55 seconds. O'Donnell, who was third, made the distance in 3 hours, 31 minutes, 45.5 seconds, about 3 minutes behind de Palma. The winner used Oil-zum for motor lubricant.

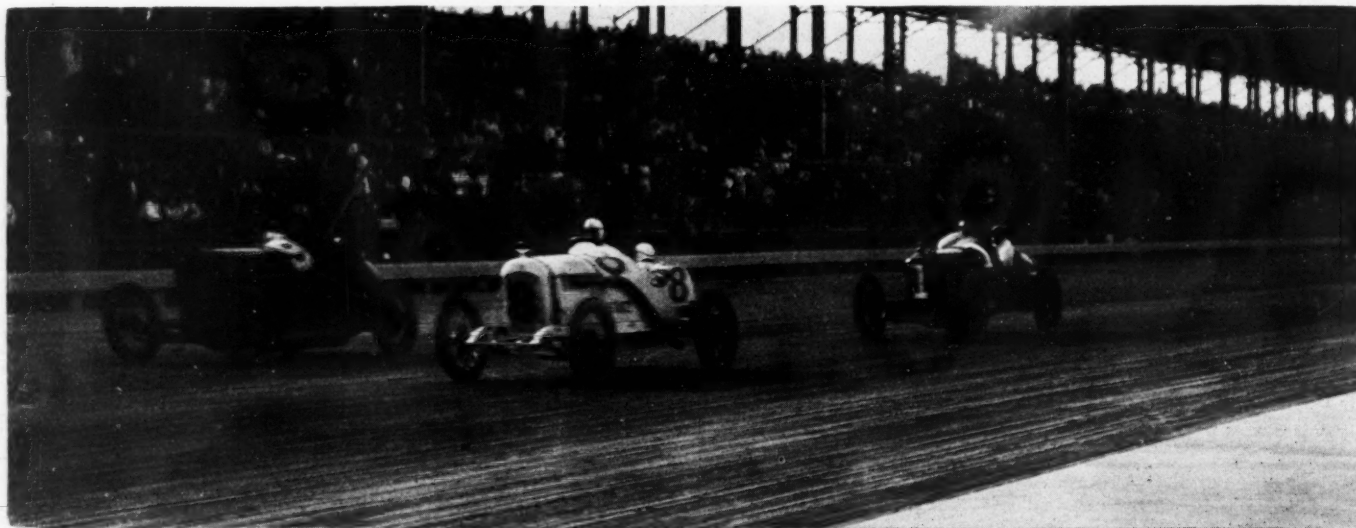


WRECKED SECTION OF DES MOINES SPEEDWAY, SHOWING WHERE JOE COOPER'S SEBRING CRASHED THROUGH SAFETY WALL IN FRONT OF GRANDSTAND. AT RIGHT—JOE COOPER, WHO WAS KILLED IN THE ACCIDENT



Resta in Peugeot Wins Challenge Race at 101.86 M.P.H.

Earl Cooper's Stutz Takes Honors for Being First American Car Ever Driven Over 100 Miles in 1 Hour and Finishes Second



BURMAN AND COOPER PASS RESTA AT THE END OF THE TWENTY-EIGHTH MILE AND ARE EVEN AT THE TAPE

By J. C. Burton

CHICAGO, Aug. 7.—For the first time in the history of motor car racing in America, 100 miles were crowded into an hour here this afternoon when Dario Resta, at the wheel of his invincible blue Peugeot, defeated Earl Cooper's Stutz, Burman's Peugeot and Oldfield's Delage in the 100-mile challenge race run on the Chicago speedway. The victor's time for the century was 58 minutes 54.2 seconds and his average 101.86 miles per hour.

In winning the Chicago challenge trophy and the title of world's speedway champion, Resta established a world's competitive record for 100 miles. Three European drivers, the late Percy Lambert, Jules Goux and Jean Chassagne, have covered the century at greater speed than did the Peugeot pilot today but their marks were made in time trials on the Brooklands track and not in competition.

Cooper 40 Seconds Behind

Earl Cooper, in the Stutz, was second, finishing 40 seconds behind the victor after a menacing and desperate challenge for fifty laps of the 2-mile oval. Cooper's time was 59 minutes 31.4 seconds and his average 100.71 miles per hour.

Burman, driving a Peugeot with a larger motor than that carried by his stellar foe, was third at a speed of 97.70 miles per hour, his time being 1 hour 1 minute 22.4 seconds. Although forced to make three stops for tires, while Resta made but one, Burman clung tenaciously to the Peugeot and Stutz for two-thirds of the distance. After that he gradually

TIME OF EACH CAR EVERY 10 MILES IN CHICAGO CHALLENGE RACE

DRIVER	CAR	10	20	30	40	50	60	70	80	90	100	M.P.H.
Resta.....	Peugeot...	5:45*	11:31.60*	17:22.9	23:10.05	28:58.6*	34:49.6*	40:41.2*	47:19.4	53:08.0*	58:54.2*	101.86
Cooper....	Stutz.....		11:31.65	17:22.8*	23:10.00*	28:58.8	34:49.7	40:41.3	47:04.0*	53:50.0	59:39.4	100.58
Burman...	Peugeot...		11:40.00	17:23.0	23:10.10	30:30.0	36:17.4	42:59.0	48:47.2	54:35.0	61:22.4	97.78
Oldfield...	Delage ..		13:50.00	20:01.0	26:22.00	34:06.0	40:31.2	46:41.0	55:26.0	62:31.2	Flagged	at 90 m

*Leader.

fell back until he was a lap behind the pace-makers.

Barney Oldfield, the original challenger, did not complete the 100 miles. His Delage, recently imported from France, was a disappointment. Carburetor trouble developed in practice and the veteran went to the starting line with a disabled car. He was never a contender. His mount was the slowest in the field and he had to change three right front wheels. The Delage was five laps behind when Resta's

Peugeot flashed over the tape for the last time and Starter Wagner flagged Oldfield in.

Picked as a favorite before the field was sent away, Resta justified the common prediction that his Peugeot was the fastest car in the field and would have little trouble defeating its three opponents. The Italian drove with supreme confidence. He always had speed in reserve for the emergency. He was first across the wire on forty of the fifty laps of the race. He

lost the lead for four circuits when he stopped for a right rear tire change after completing 74 of the 100 miles. The stop cost him 26 seconds. Four laps later, on his eightieth mile, he regained the lead, however, as Cooper was forced to change a front wheel and spent 37 seconds at his pit.

From the eightieth mile on, there was no question as to whom would be the victor. Resta had the necessary speed to draw away from the Stutz and throw off Cooper's sensational but futile challenge for first-place honors.



DARIO RESTA AT THE FINISH

Although he established a world's 100-mile competitive record, Resta failed to better the marks made in time trials by Lambert, Goux and Chassagne at Brooklands in 1913. The century records for these three drivers are as follows:

Car and driver	Time	M.P.H.
Talbot, Lambert	57:49.38	103.76
Peugeot, Goux	56:29.93	106.20
Sunbeam, Chassagne	55:35.55	107.93

Resta's achievement today is not dimmed by comparison with these records, however, as his mark of 101.86 miles per hour was made in competition by a car of less rated horsepower than the three Brooklands' time-destroyers, Resta's Peugeot rating at about 20 horsepower, Lambert's Talbot 25 horsepower, Goux's Peugeot 30 horsepower and Chassagne's twelve-cylinder Sunbeam 47.6 horsepower at 1,000 feet per minute piston speed.

Before the start of the challenge race, Harry Stutz protested Burman's car, which has a piston displacement of 338 cubic inches. The A. A. A. sanction called for a maximum piston displacement of 300 cubic inches and the Indianapolis maker asked the officials to force Burman to withdraw although all of the drivers had consented to Bob's using the larger motor. After a lengthy conference, Stutz withdrew his protest in order not to disappoint the 20,000 speed fans that had gathered to witness the battle royal.

The drivers drew for starting positions and the fates decreed that Oldfield should have the pole with Resta, Cooper and Burman lined up abreast in the order named. The start, originally scheduled for 3 o'clock, was delayed ½ hour in order to allow a number of touring cars, held up by a jam at the entrance, to reach their parking spaces.

Resta Takes Lead at Start

The field was sent away on the scoring lap at 3:40 o'clock and after one circuit of the board oval, crossed the wire in perfect alignment. Resta led at the end of the first lap, which was turned in 1 minute 11 seconds, with Cooper and Burman close up. Cooper and Resta alternated in setting the pace for the next three laps and then the Italian went to the front. The first 10 miles were covered in 5 minutes 45 seconds, an average of 104.35 miles per hour. Oldfield was trailing at least a mile behind.

Resta and Cooper crossed the tape hood to hood on the eighth lap and Cooper led on the next circuit but the Italian passed

the Stutz in the next 2 miles and completed the first 20 miles in 11 minutes 31.6 seconds. Oldfield made the first stop of the race on his ninth lap, changing a front wheel in 40 seconds, and was lapped by the leaders.

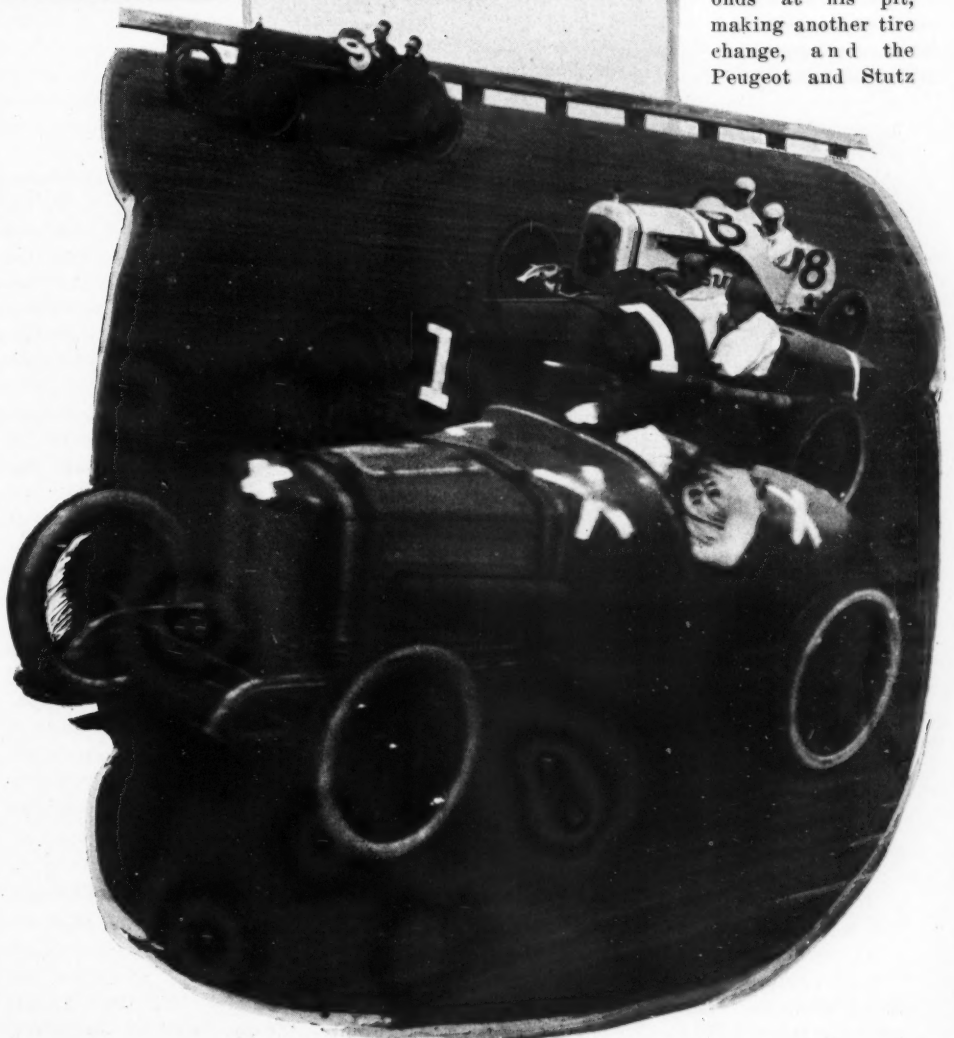
On the next three laps, Resta maintained his slight advantage but on the fourteenth circuit of the course, Cooper took the lead

in a sensational home-stretch drive and at the completion of 30 miles, covered in 17 minutes 22.8 seconds, was a car's length ahead of the Peugeot. Burman gained a little ground at this stage of the race and was in a commanding position. At times, the three cars could have been covered with the proverbial blanket.

Resta overtook the Stutz on the sixteenth circuit of the track and held the lead until 40 miles were completed when Cooper again forged to the front. His time for the 40 miles was 23 minutes 10 seconds and his average 103.59 miles per hour. Burman changed two right tires in 46 seconds on his twenty-first lap and was lapped by Resta and Cooper.

Resta was in the lead at the completion of 50 miles, his time being 28 minutes 58.6 seconds and his average 103.53 miles per hour. At this stage of the race, Oldfield had dropped three laps behind, Resta also was setting the pace at the end of the 60 miles with Cooper and Burman close up. Burman was driving desperately to regain the time lost in stops for tires and picked up some ground.

On his thirty-third lap, however, Burman lost 16 seconds at his pit, making another tire change, and the Peugeot and Stutz



TOP—DARIO RESTA AND HIS WIFE. BOTTOM—OLDFIELD, RESTA, COOPER AND BURMAN ON THE TURN IN THE INITIAL LAP

drew away from him once more. Resta led at 70 miles, his time being 40 minutes 41.2 seconds.

The Italian did not hold this advantage for long. At the completion of 74 miles he was forced to stop for a rear wheel. He made the change in 26 seconds and started in pursuit of the Stutz that had passed him. Cooper was setting the pace on the thirty-eighth, thirty-ninth and fortieth laps but then lost 40 seconds in making a tire change and surrendered the lead. Cooper's time for the 80 miles was 47 minutes 4 seconds and the average had dropped from 104 to 101.98 miles per hour.

Cooper's tire change lost him a lead that he never regained. Resta opened up and made several laps faster than previously, covering the 90 miles in 53 minutes 8 seconds. Burman's third tire change on his forty-seventh lap cemented him in third place and the race was all over but the award of the challenge cup and medal.

Although Resta was favorite, Cooper and the Stutz seemed to be the most popular driver and car of the afternoon. The Californian and his white mount were cheered repeatedly and their challenge of the Peugeot brought the spectators in the grandstand to their feet. Cooper put up a great fight for the challenge cup but his car lacked the speed of the blue thoroughbred of steel.

The race was run under the most favorable auspices, the sun coming out and the mercury in the thermometer registering around 70 degrees. About 20,000 turned out to watch the speed feud.

EQUIPMENT OF CHALLENGERS

DRIVER	Resta	Cooper	Burman	Oldfield
CAR	Peugeot	Stutz	Peugeot	Delage
MAG.	Bosch	Bosch	Bosch	Mea
PLUGS	Olio	Bosch	A. C.	Rajah
CARB.	Zenith	Stromberg	Zenith	Claudel
TIRES	S'town	S'town	S'town	Firestone
WHEELS	R-W	Houk	R-W	R-W
OIL	Oilzum	Oilzum	Oilzum	Castor

TRACK COMPLETED AUGUST 15

Minneapolis, August 6—With the cessation of rain, the working force at the Twin City speedway has been tripled and work is to be finished August 15. One entire grandstand, nearly 10,000 seats, was sold to St. Paul resident today, nearly every drug store keeper in Minnesota, the Dakotas, Montana and parts of Iowa has been enlisted in selling seats. Placards and newspaper advertising in every county in Minnesota refer ticket buyers to the druggists.

W. W. Brown, in a Du Chesneau, filed his entry yesterday.

A cup has been offered by the speedway for touring clubs, the number of miles traveled multiplied by cars taking part giving the score. If 100 cars cover the 176 miles from Duluth, the city will receive 17,600 points.

The adjutant-general of the United States army has approved the plan to extend the street railway through the reservation at Fort Snelling from the inter-urban line to the speedway.

Revive Corona Race

Native Sons Hope to Hold Classic in Circle City

Will be Only Road Event on Pacific Coast

CORONA, Cal., Aug. 6—With a desire to see Eddie Pullen's world's road race record shattered on their own course, the citizens of Corona, California's circle city, have announced that there will be a third revival of the Corona road race this fall. As southern California's only road race, and probably California's only speed carnival during the coming fall and winter months, the Corona classic is the one bright spot on the golden state's failing speed calendar.

The proposed 1915 Corona road race will not be run on Thanksgiving day, as was the case last year. It probably will be staged the first Saturday in November.

The third Corona race will be the only road race held in this section, according to present indications. The great Los Angeles-Phoenix road race seems to be an utter impossibility, owing to opposition from state and county officials and lack of interest.

For several months it has been known that the Panama-Pacific cup race, planned for this fall at San Francisco, had been abandoned. The exposition officials are working on plans for short races this fall.

There is no chance for a race at Venice. The citizens of the beach city had all they wanted of road racing last March, when they lost something like \$12,000.

The Santa Monica course, southern California's first speed trail, is locked by the citizens of Santa Monica against the speed merchants, and it is generally believed that the Point Loma course at San Diego is too slow to attract a paying crowd.

There may be some events staged on the mile track at Ascot park, in Los Angeles, but even the city track is no longer popular with the race fans.

There is still some talk of the Los Angeles speedway. A. M. Young, veteran race manager of this section, has been giving a certain amount of his time to the project and says that he believes that the speedway will go through.

HOOSIER 100-MILE INVITATION

Indianapolis, Ind., Aug. 10—Special telegram—Indianapolis will stage a 100-mile invitational race for a \$10,000 purse October 9, sanction for this date having been granted the speedway by the American Automobile Association today. The event is to be strictly an invitational af-

fair, the drivers being Resta, Cooper, de Palma, Aitken, Anderson, Rickenbacker and Oldfield.

The maximum piston displacement is to be 300 cubic inches. Five thousand dollars will be given in cash to the winner and the division of the other \$5,000 among the remaining contestants has not been decided upon. C. W. Sedwick, manager of contests, already has received acceptances from de Palma and Oldfield.

RAISING MONEY FOR SPEEDWAY

St. Louis, Mo., Aug. 7—Initial steps toward raising a \$500,000 fund for the building of a speedway and grandstand at Maxwellton, St. Louis county, were taken here this week at a meeting of a body of men whose identity is being kept secret for the present.

Frank Arcutt, one of the few who would admit they attended the meeting, said part of the half-million-dollar fund already had been raised and that it is not improbable that construction will be started soon.

Maxwellton at present has an excellent mile dirt track and a large wooden grandstand. It has been the scene of numerous fairs and minor races. The speedway and concrete grandstand will be erected in an effort to bring first-class cars and drivers to St. Louis.

DESERT CLASSIC ABANDONED

Phoenix, Ariz., Aug. 9—There will be no Desert race from Los Angeles to Phoenix for the Arizona state fair in November this year, but the race over the Borderland from El Paso to Phoenix promises to be a bigger event than ever. The purse for the race from Los Angeles has each year been subscribed by the towns along the route over which the race was run, but Los Angeles did not subscribe on any occasion. This year Phoenix invited Los Angeles to come in on the purse but the latter city refused. The Phoenix people decided that it would be best to call off the Los Angeles race entirely, doubling up and centering all funds and efforts on the big event from the Pass City. There is every prospect that the purse for the El Paso-Phoenix race this year will be the biggest ever offered for any road race.

ELGIN EXPECTS THREE CHAMPIONS

Chicago, Aug. 10—Entry of Ralph Mulford with a Peugeot for the sixth annual Elgin road race, which is expected tomorrow, will mean the competition of three road-racing champions in the classic. De Palma, a two-time winner of the Elgin National trophy, will have to defend his claim from the assaults of Cooper and Ralph Mulford, the latter also a former winner of the 300-mile race.

Mulford expects to receive word that the Peugeot, owned by Brown, of Orange, Texas, will be placed at his disposal this week for the Watch City events August 20 and 21. The car is a duplicate of

Resta's record-breaker and is said to be equally speedy.

Sixteen entries have been received for the 2-day meet, eight for each day. The entry list to date is as follows:

CHICAGO AUTOMOBILE CLUB CUP RACE	
Mercer	Henning
Duesenberg	Henderson
Duesenberg	O'Donnell
Stutz	Bragg
Stutz	Cooper
Stutz	Anderson
Mercedes	de Palma
Du Chesneau	Brown

ELGIN NATIONAL TROPHY RACE	
Duesenberg	O'Donnell
Mercedes	de Palma
Stutz	Bragg
Stutz	Cooper
Stutz	Anderson
Du Chesneau	Brown
Stutz	Burt
Anderson Special	Scott

Among the immediate possibilities are Oldfield's Delage, Mulford's Peugeot, a Mercer to be piloted by Patrick—a driver who hitherto has avoided the limelight.

TOPEKA PLANS PERMANENT SHOW

Topeka, Kan., Aug. 6—A committee of the Topeka Commercial Club is arranging for a permanent motor car exhibition building at the state fair grounds here. The first step will be to secure the co-operation of the local dealers, the extent of which will measure the size and capacity of the building.

It is probable that the building will be permanent with cement floors and probably open walls, so that the crowds may pass in and out conveniently.

J. M. OFFERS FREE TIRE REPAIRS

Philadelphia, Pa., Aug. 6—The J. M. Shock Absorber Co. has secured the exclusive sales agency for National tires and tubes in Philadelphia and New York. It is proposed to make all repairs on National tires free of charge without this added service in any way affecting the list price of the tire, or the 5,000-mile guarantee.

SUES ON TRADEMARK INFRINGEMENT

Chicago, Aug. 9—Suit for \$200,000 damages against Montgomery Ward & Co. was filed in the United States district court by the Monahan Antiseptic Co. The bill also asks for an injunction to restrain Montgomery Ward & Co. from infringing the registered trade mark of the complainant company for Green Oil soaps.

FRENCH ARMY RELEASES DRIVERS

Paris, France, July 28—France still is able to lend some assistance to America in the way of furnishing racing drivers and racing cars. At present two drivers of international reputation are free from army service, these being, Thomas, winner of the 1914 Indianapolis race, and Bablot, who has had international reputation. Cars available are three Delages and one each of Schneider, Alda and Nagant. The following drivers are not available as they are doing army duty: Goux, Boillot, Guyot, Chassagne, Duray, Hemery, Rigal and Wagner.

Astor Offers Trophy

Inaugural at Sheepshead Bay to Be for New Cup

Gotham Speedway Nears Completion for Fall Event

NEW YORK, Aug. 9—When the Sheepshead Bay speedway opens on October 2, the 350-mile inaugural race will be for a perpetual trophy which was offered yesterday by Vincent Astor, the event to be known as the Vincent Astor Cup race. Originally it was intended to have the first race known as the American Cup race, but with the offering of the Astor cup it was decided to make this the first race over the speedway, and the American cup race will be contested at a later date.

With the smooth wooden surface of the Sheepshead Bay speedway now laid for the 2-mile circuit, with only a few stretches of steel framework on the outer edge uncovered by planking, New Yorkers owning fast cars have been itching to try out for themselves the speed possibilities of the course. Manager Everard Thompson, however, is adamant in his determination that there shall be no high-speed test of the curve-banked track until it is thrown open next month to the entrants for practice for the opening 350-mile race on October 2. Accordingly no one is admitted to the speedway without a pass and if allowed on the track at all is forbidden to indulge in anything faster than mere touring speed.

The progress in the construction of the grandstand has kept pace with that of the course itself. The steel framework of the double-deck grandstand has been erected for close to a thousand feet along the homestretch.

NEW A. A. A. REPRESENTATIVES

Indianapolis, Ind., Aug. 6—Charles W. Sedwick, who has been the Indiana representative of the American Automobile Association since 1908, has resigned and Chester Ricker has been appointed to fill the vacancy.

Detroit, Mich., Aug. 9—W. D. Edenburn has been appointed Michigan representative of the contest board of the A. A. A.

FORD MAY DISCONTINUE SEDAN

Detroit, Mich., Aug. 9—It is reported but neither confirmed nor denied by officials of the Ford Motor Co. that after the present stock of Ford coupelets and sedans has been closed out, these two models no longer will be marketed. The prices of these models which thus far were \$750 for the coupelet and \$975 for the sedan have been reduced \$50, making them respectively \$700 and \$925. It was stated by the in-

formant that there has never been a great demand for these models and that the three models announced for next season, namely, the runabout, the touring car and the town car, comprise those models which practically 95 per cent of the buyers ask for.

BUDLONG LEAVES PACKARD

New York, Aug. 11—Special telegram—Milton J. Budlong, president of the Packard Motor Car Co., of New York, Chicago and Philadelphia, has resigned to become vice-president of the importing and exporting firm of Gaston, Williams and Wigmore, Inc., which has been selling motor trucks to many of the warring nations. He has been with the Packard company 7½ years. He will be succeeded as president of the Packard Motor Car Co., of New York, by E. B. Jackson, manager of the Philadelphia company, who will retain the general supervision of that organization. H. M. Allison, who for years has been manager of the Packard Motor Car Co., of Chicago, will follow Mr. Budlong as its president.

LYONS ATLAS QUILTS CAR BUILDING?

New York, Aug. 11—Special telegram—The Lyons Atlas Co., Indianapolis, Ind., manufacturer of the Lyons Knight motor cars, it is believed, will temporarily discontinue the manufacture of motor cars and confine its activities to the manufacture of engines and parts. Some change in manufacturing policy of this nature has been trade rumor in the Hoosier capital for some time. The general impression is that while present plans are to cease manufacture for the time being there is a possibility that the company may reconsider manufacturing at a later date. The company's new test cars are still on the road undergoing road tests but some of the motor car experts in connection with the factory have been released from duties.

NEW HARVARD ROADSTER

Troy, N. Y., Aug. 7—The Pioneer Motor Car Co., of this city, is putting on the market a car known as the Harvard, which is in roadster form and fully equipped, sells for \$750. It is designed to fit in with the present tendency towards small, luxuriously fitted cars which will be economical as regards upkeep and at the same time furnish the comfort found in larger cars. The power plant is 2¾ by 4½, Model motor with the L-head cylinders cast in a block and having the intake and exhaust manifold integral.

Some of the specifications include 1½ inch valves, Carter carbureter, Bosch ignition, left or right drive optional, electric lighting and starting, unit power plant, three-speed gearset, semi-floating axle, quarter elliptic springs, 28 by 3-inch wire or wood wheels, wheelbase 100 inches. The body is of sheet steel, aluminum and wood, and the standard color is maroon with black running gear.

Tractor Tests Are Watched by Farmers at Champaign

Demonstration of Agricultural Motors Attracts Attention of Thousands—To Be an Annual Affair

CHAMPAIGN, Ill., Aug. 6—Ten thousand farmers attended the first Illinois tractor demonstration upon a spacious tract 5 miles south of this city last week. Four days were selected for the exhibition but the opening days were marked by rain, which limited the show to the 2 closing days, Thursday and Friday. Despite the weather handicap, the demonstration was voted a great success, and, at the banquet served to visiting tractor men at the Hotel Beardsley on Thursday night, a movement was launched to give a similar event each year hereafter. According to

the plans favored, it will be a tri-state affair, taking in Indiana and Iowa in addition to Illinois.

Due to the proximity of the University of Illinois, and its well known attraction for all followers of agriculture, Champaign was the choice of the visitors as the permanent location of the annual exhibit and it is believed that definite arrangements will be made later for the second demonstration some time in August of 1916. It is likely that in all future events, the attraction will be limited to tractors.

The demonstration given this week was

not a contest and no prizes were awarded. Its purpose was to give farmers an opportunity to see practically all the important makes of farm tractors doing actual field work and, under conditions as nearly identical as possible. To this end, all fuel used was of the same grade, the depth of plowing and engine speed regulated, and every effort made to make the demonstration a real showing of what the machines can do on farm work.

Mornings were devoted to private demonstrations at which the manufacturers were given considerable latitude in the kinds of work performed. The formal demonstration took place in the afternoon. Each machine was allotted a strip of ground for plowing in accordance with the rules of the field manager. The following were the list of exhibitors:

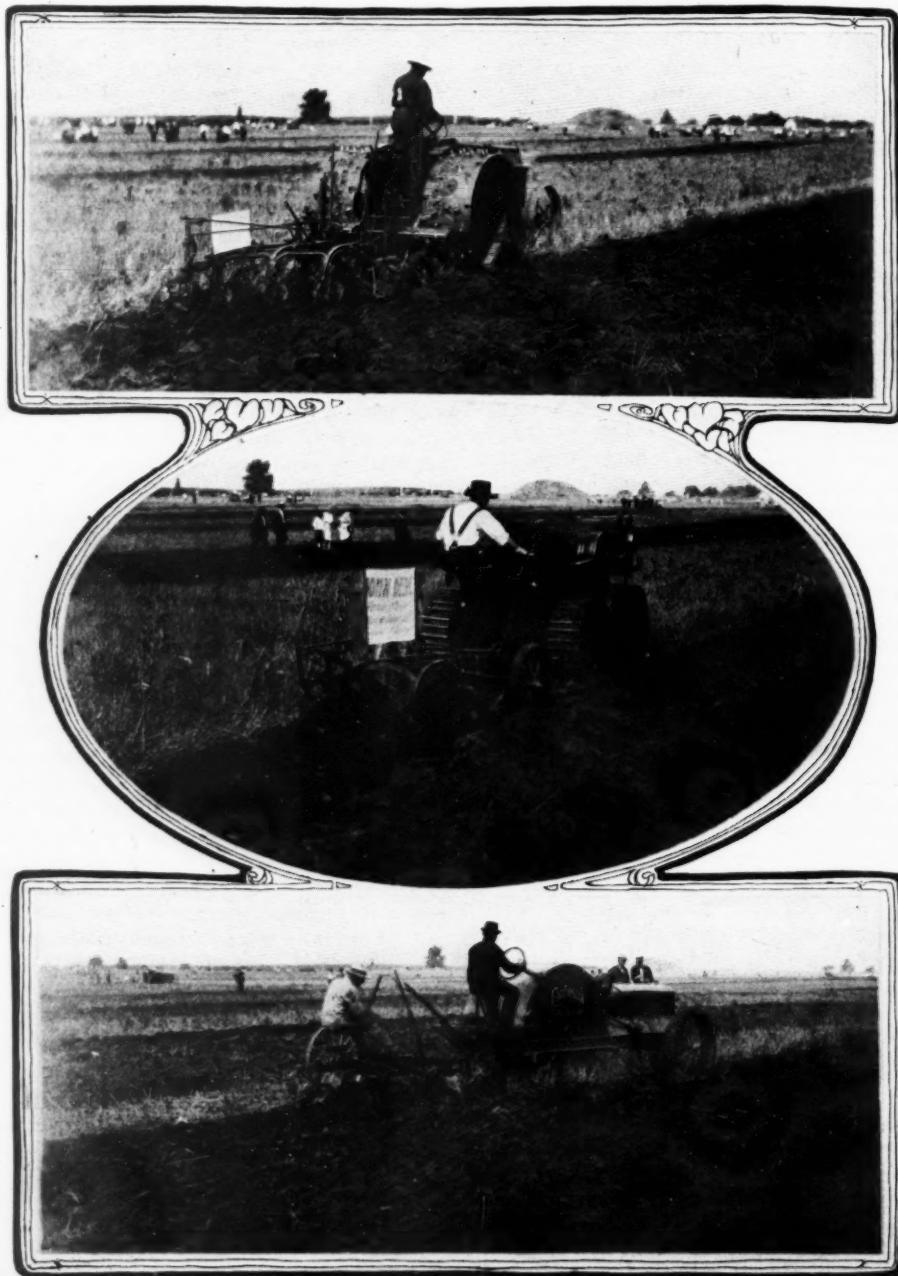
Avery Co., Peoria, Ill.; Bates Tractor Co., Lansing, Mich.; Bull Tractor Co., Minneapolis, Minn.; Bullock Tractor Co., Chicago; J. I. Case Co.—Wallis Tractor—Racine, Wis.; Corn Belt Tractor Co., Minneapolis, Minn.; Dayton Dick Co.—Leader Tractor—Quincy, Ill.; Dauch Mfg. Co., Sandusky, Ohio; Denning Motor Implement Co., Cedar Rapids, Ia.; Electric Wheel Co., Quincy, Ill.; Emerson-Brantingham Co., Rockford, Ill.; Ford Tractor Co., Minneapolis; Hartr-Parr Co., Charles City, Ia.; Helder Mfg. Co., Carroll, Ia.; Hoke Mfg. Co., South Bend, Ind.; Holt Mfg. Co., Peoria, Ill.; Huber Mfg. Co., Marion, Ohio; Hume Tractor Co., Hume, Ill.; International Harvester Co., Chicago; Joliet Oil Tractor Co., Joliet, Ill.; Kinnard-Haines Co., Minneapolis; Lawter Tractor Co., St. Marys, Ohio; Lion Tractor Co., Minneapolis; Parrett Mfg. Co., Chicago; Peoria Tractor Co., Peoria, Ill.; Sweeney Tractor Co., Kansas City; Steel King Tractor Co., Detroit; Universal Tractor Co., Columbus, O.; Waite Tractor Co., Chicago, and Waterloo Gasoline Engine Co., Waterloo, Ia.

Thirty-two Tractors in Field

The climax to the demonstration came on Friday when thirty-two engines, pulling from two to six plows, went along side by side in a stubble field 110 acres in extent. The larger type of machine built to pull eight plows of 14-inch bottoms, and the smaller type, with but two plows connected, worked side by side and the farmers were able to note the advantages of each. Turning under 3-foot rag weeds in ground that had not been touched by a plow for many years, was a severe test for the tractors and some had all they could do. A 40-acre field of sod was plowed up in quick time.

It was observed that tractors which had been prime favorites on the exhibition lot, were not so popular after the plowing tests started, while others that had been regarded as freaks and which had been humorously regarded, were able to give a better account of themselves than their more pretentious neighbors.

Several hundred sales were reported as a result of the exhibition and all companies represented were well pleased over the results. Incidental to the demonstration there were evening programs of lectures.



TRACTORS IN DEMONSTRATIONS AT CHAMPAIGN

Jackson Highway Association Plans Lake-to-Gulf Road

Organization Purposes to Amalgamate State Bodies—Balm to Cities for Dixie Loss

LOUISVILLE, Ky., Aug. 6—Concerted effort now in progress probably will crystalize some time this month in the definite formation of a new highway from the lakes to the gulf, the new and direct route to be formed from routes of various other highway associations now established. While plans to date are more or less tentative in nature, the route probably will be known as the Jackson highway, joining Chicago on the north with Pensacola and New Orleans on the south, passing through La Fayette, Indianapolis, Louisville, Bardstown, Gallatin, Tenn., Nashville, Birmingham, Ala., and Montgomery. It also is the purpose of those fostering the project to establish a branch running from some point at the north, between Louisville, Ky., and La Fayette, Ind., to either Cleveland or Buffalo. Both of the latter cities are seeking to be made the eastern terminal of this new road.

Peter Lee Atherton, president of the Central Lincoln Road Association, with headquarters at Louisville, Ky., has been made temporary president of the Jackson Highway Association. This action resulted from a meeting held early this month at Birmingham, Ala., at which the temporary body was formed for the purpose of merging the different state organizations to the end that a permanent Jackson Highway Association may be formed. Mr. Atherton has established headquarters for the temporary organization in Louisville.

In Form of a Y

The proposed highway will have the form of a Y, with the two northern divisions probably converging at Louisville—but this may be changed—and thence running in a single line to Pensacola, where it will follow the gulf to New Orleans. Opinion along the route seems to be that this proposed route can be made second in importance only to the Lincoln highway. It is maintained that it would rank second to the Lincoln only in length, while in use it would lead, since it would be an all-the-year-around route.

At the present time, there are several highway associations between Chicago and New Orleans that are seeking to combine on this project. There is the Lakes-to-the-Gulf Highway Association, in Indiana, with headquarters at Salem. There is the Central Dixie Highway Association, in Kentucky. This association advocates the Central Lincoln or Bardstown route in Kentucky via Bardstown and Glasgow to Nashville. There is the Jackson Way Association, which is backing the Nashville-Birmingham-Montgomery-Pensacola-New Orleans route.

The Jackson Highway movement was

originated several years ago by the Daughters of 1812. It was conceived as a memorial to Andrew Jackson, and was planned to run through the territory in the South associated with historical events of the war of 1812. The Jackson Memorial Association, of which Miss Alma Rittenberry, of Birmingham, is secretary, had a large part in promoting the route.

At the Birmingham meeting, several projects, heretofore not allied, were virtually brought together, Atherton's Kentucky project being among them. Those in touch with the situation expect to see the Indiana Lakes-to-the-Gulf project also connected with the Jackson Highway movement. It was decided to call the road the Jackson Highway, and it is thought that all the associations will agree to this name.

It is expected that Columbus and Aberdeen, in Ohio, and Maysville, Carlisle,

Paris and Lexington, by way of the old Lexington and Maysville pike in Kentucky will be on the arm branching to the east. The branch then would come to Louisville by way of Versailles, Frankfort and Shelbyville, joining the branch from Chicago.

From Louisville to Nashville the old Central Lincoln road via Bardstown and Glasgow, the project fostered by Atherton, is expected to be followed. From Nashville south the line will pass through the states of Tennessee, Alabama, Mississippi and Louisiana. The Jackson highway will be about 1,600 miles in length.

Rivals Get Together

If the various associations get together, it is stated, the Lakes-to-the-Gulf association in Indiana will decide upon the Lafayette route north of Indianapolis to Chicago.

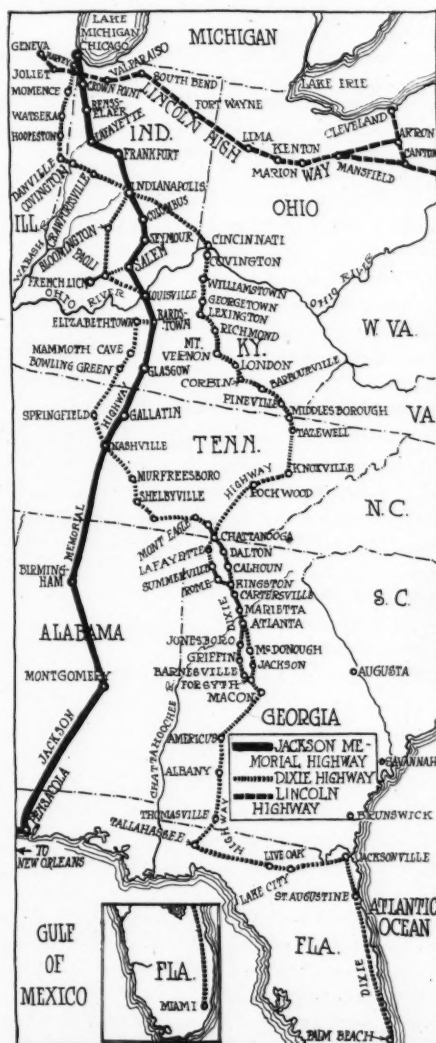
The Indiana association has been wavering between the Lafayette and the Logansport-South Bend routes north of Indianapolis. E. F. Routh, of Salem, Ind., corresponding secretary of the Lakes-to-the-Gulf Highway Association, is authority for the statement that the Lafayette route will be selected, if his association joins with the Jackson highway organization. If this is done, he says, the line probably will run through Lafayette, Frankfort, Rensselaer and Crown Point to Chicago.

The Michigan people who want the Lakes-to-the-Gulf Highway Association to take the South Bend route and to run up along the west side of the lower peninsula, Secretary Routh states, will hold a meeting soon to consider that project. After that meeting it will be possible to indicate the route north of Indianapolis more definitely.

The route as proposed would pass such historical places as the Lincoln memorial farm near Hodgenville, Ky., where Lincoln was born, and the Hermitage, at Nashville, where General Andrew Jackson lived. From Nashville to New Orleans it would follow in a general way the route taken by General Jackson in his march to New Orleans to combat the British. Mammoth Cave, of course, is one of the nearby attractions of the Jackson highway, as it is of the Dixie highway.

BEMENT HIGHWAY VICE-PRESIDENT

Detroit, Mich., Aug. 6—A. F. Bement, who was director of publicity of the Lincoln Highway Association, has been chosen to succeed A. R. Pardington, who was vice-president and secretary and who passed away last week. The successor of Mr. Bement as director of publicity is S. A. Host.



PROPOSED ROUTE OF JACKSON HIGHWAY, SHOWING RELATION TO THE LINCOLN AND DIXIE HIGHWAYS

Power May be Changed by Use of Exhaust Muffler

THERE is a great deal of misunderstanding among motorists as to just what effect the use of the muffler has upon the power developed by the engine. While it is true that ordinarily there is some loss of power occasioned by the silencing of the exhaust gases, quite frequently the loss is not nearly so great as imagined and sometimes there is even a gain in horsepower when a muffler is used as compared with that obtained without the muffler and exhaust pipe.

Off-hand this seems very illogical, because the muffling of the exhaust—that is, the reduction of the sound of the explosion—depends upon the slowness with which the gases are permitted to escape to the air. That is, the more rapidly the gases are allowed to expand into the atmosphere the louder will be the sound of the explosion. To slow down the speed of the gases in their escape, means that there must be a certain amount of back pressure which reduces the effective pressure of the gases on the piston and so lessens the power developed.

However, there are certain conditions in which the use of the muffler, if the muffler and exhaust piping is properly designed in which there is less back-pressure than if there were neither exhaust piping nor muffler and the cylinders were permitted to exhaust directly into the atmosphere. When the exhaust manifold is removed and the exhaust gas permitted to escape directly into the air, the atmosphere itself exerts a certain opposition to the flow of the gas to the cylinders.

With an exhaust pipe of the proper length and proper diameter and a long easy curve the passage of the gases from one cylinder to the pipe may act as a piston to clear the air out of the exhaust pipe and thus remove all resistance to the passage of the exhaust from the next cylinder to fire.

This effect oftentimes is sufficiently great to make up for it the slight loss due to the back-pressure in a well designed muffler so that a comparative test of an engine with exhaust pipe and muffler, if properly designed, would show greater

power than with the same engine if exhaust pipe and muffler were disconnected from the cylinders.

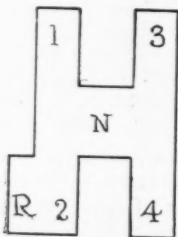
This fact has been brought out in a communication to the English motor magazine "Autocar" in which the writer describes and gives the results of a test of a standard engine which showed $\frac{3}{4}$ horsepower more with the exhaust pipe than without it, although when the muffler was attached to the exhaust pipe, the horsepower was still less than when the engine was exhausting into the open air. This tends to show that supposed gain in horsepower obtained by the exhaust pipe and muffler should be credited to the exhaust pipe rather than to the muffler.

UNCLE SAM WANTS TRUCKS

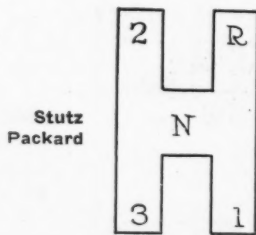
Washington, D. C., Aug. 10—Special telegram—On September 8 the postoffice department will open bids for furnishing and delivering from time to time, as they may be required during the next fiscal year for use in the postal service, the following gasoline motor trucks:

Five or more of $\frac{1}{2}$ -ton capacity; five or more of $\frac{3}{4}$ -ton capacity; five or more of $1\frac{1}{4}$ -ton capacity; five or more of 3-ton capacity.

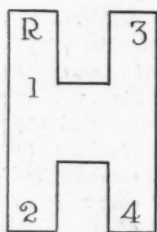
CAR DASH



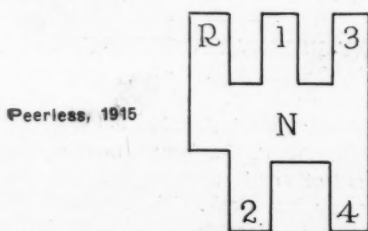
Chalmers, Master



Stutz
Packard



Pierce-Arrow, 1915



Peerless, 1915

CAR SEAT

Gearset Lever Positions in Many Makes of Cars

HEREWITH are shown eight different types of gearshift quadrants and the reader, familiar with the types shown in last week's issue of Motor Age, can see readily that there are few individual types except those with four speeds. The distinctive types illustrated herewith are Winton, Moline-Knight 50, Peerless, Pierce-Arrow. The Chalmers Master six uses the same four-speed quadrant as the Jeffery six illustrated in the August 5 issue.

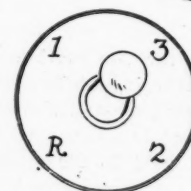
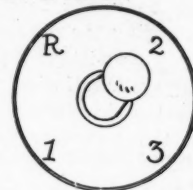
It is quite clear that the type used by Scripps-Booth, Kisselkar, Westcott, etc., is the predominating one in the three-speed class. Of forty-eight representative makes twenty-six have their speeds located as in these cars, although of this number fourteen use the ball-and-socket type and twelve the H type.

The rare three-speed quadrant is that used on the Velie 22, the only other example among prominent makes being the Dodge. The Stutz and Packard quadrant also is employed in the Dorris and Saxon.

In the four-speed sets there are some unusual locations for second and third speeds. Thus, in the Winton and Moline-Knight 50 the second and third speeds are next to each other on the lower portion of the quadrant, instead of opposite, as is the case in the Chalmers Master six, Peerless and Pierce-Arrow. Also in four-speed sets it will be found that in most cases the reverse is in a slot by itself. However, in the Pierce-Arrow reverse is in the same line with first and second.

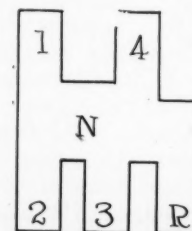
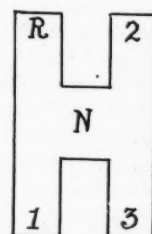
CAR DASH

Scripps-Booth
Kisselkar
Stearns-
Knight, four
Premier
Oldsmobile
Westcott



Velie, 22

Chalmers,
6-40, 6-48
Moline-
Knight, 40
Marmon, 41



Winton
Moline-
Knight, 50

CAR SEAT

Motor Coats for Sunshine and Showers of Summer



Rubberized silk coat in black and myrtle green, selling for \$20. Absolutely shower-proof and taking up very little room when folded. Shown by the Abercrombie & Fitch Co., New York



Touring goggles of chenille and silk gauze with amber-colored lenses. Price \$2

Double-breasted duster of mohair, featured by convertible collar. Price \$7. The hat shown in the illustration is made of silk and straw and is reversible. Price, \$4.25



General utility coat of imported gabardine to be had in several shades of tan, navy blue and black. This garment will stand much rough usage. Price, \$28. Shown by the Abercrombie & Fitch Co.



Sanitary goggles, made with amber-colored lenses and frame of composition white rubber than can be washed easily. Price, \$2



Found—Tour Equipment De Luxe

Party Crossing Continent with Two Cars, a Truck, Three French Maids and a Chef

RENO, Nev., Aug. 7—E. J. Longyear, multimillionaire of Minneapolis, owner of mining properties in Michigan and Mexico, registered Wednesday in Reno, having traveled across the continent with the most complete equipment of any transcontinental motor tourist yet to pass through here. Many tourists have passed through Reno this year, some with cars of an ancient vintage and others with the latest models, but Mr. Longyear and his family are traveling in a style that cannot be eclipsed by Pullman.

The party is traveling in a 48-horsepower car, a truck and a 66-horsepower power car. The truck is used to carry the eatables, and houses an ice chest and a modern stove. Only twice since they left Minneapolis have they stayed over night at a hotel—once at Denver and once at Salt Lake City. In the party besides Mr. and Mrs. Longyear are his two sons, two woman guests, three French maids, a French chef and three chauffeurs.

"I am out to see the country and I want to see it properly and not from the

ROAD CONDITIONS EPITOMIZED

Road conditions on the several transcontinental routes have undergone considerable change during the last week. Parts that were wet and muddy are rapidly becoming more conducive to the comfort of the tourist and, while somewhat rough in these sections, are likely to be in good shape by the end of this week. Other parts, as will be noted on the opposite page, are dry and dusty, while some stretches that have been good all summer, now are suffering from an over-abundance of rain. Raton, N. M., had a snowstorm August 9 and tourists found winter wraps comfortable in the 50-degree temperature. Taken as a whole, however, the transcontinental routes offer less disadvantages to heavy traffic now than at any other time this year.

observation platform of a train," said Longyear. The party is taking its time and has made a number of side trips off the Lincoln highway. The cars are equipped with special electric lighting systems and they carry a moving picture machine. The party can secure as good a dinner on the desert as at a New York or San Francisco hotel and make only short runs between camping grounds.

TOURISTS' REGISTRATIONS

Reno, Nev., Aug. 7—Volume of touring continues to increase daily through this gateway. Some of the tourists registering here, one name being taken from each group, which usually includes from four to seven, are:

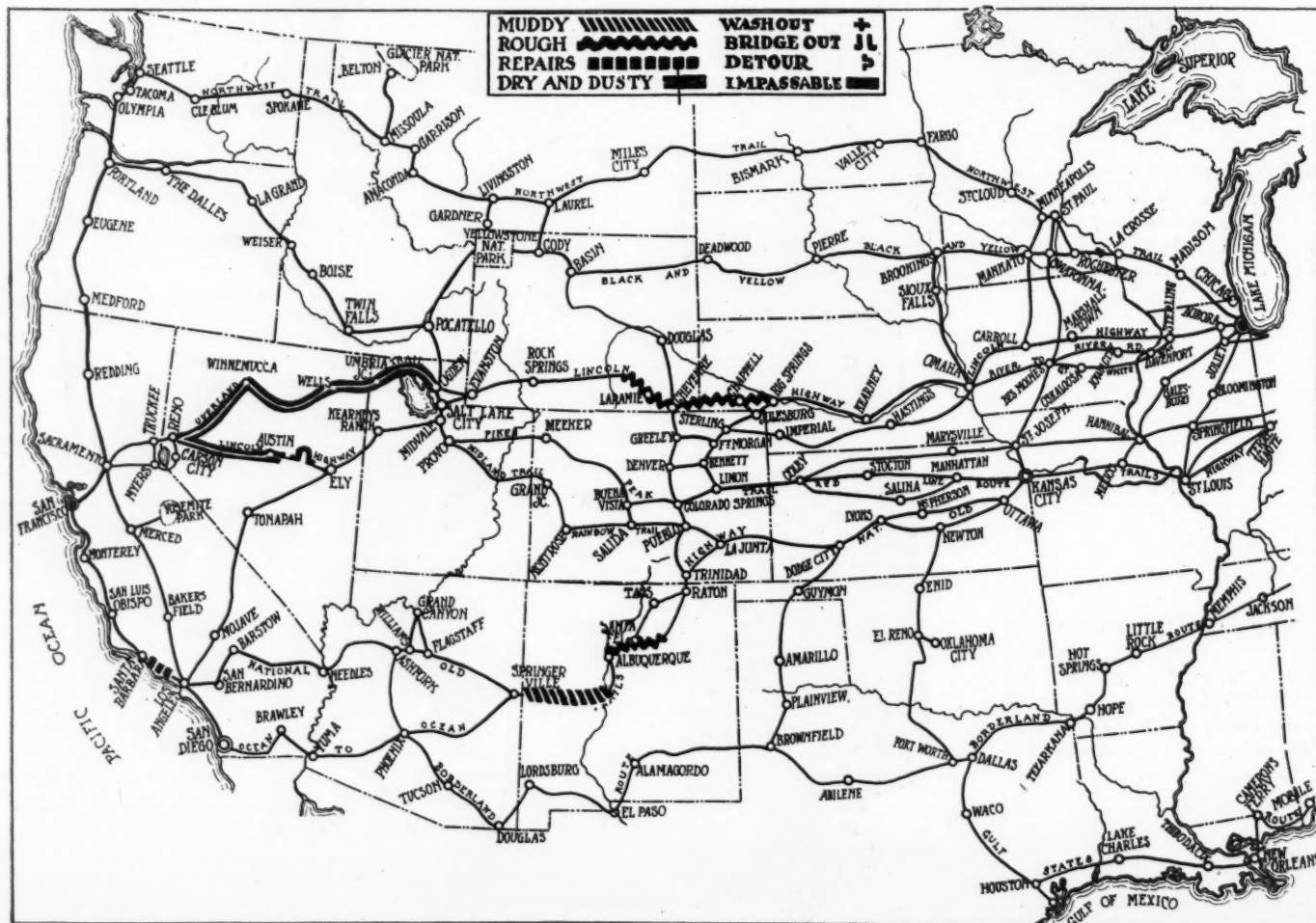
Dr. Max Levy.....Brooklyn, N. Y.
Dr. W. C. Farmer.....San Antonio, Tex.
Robert Flagg.....Syracuse, N. Y.
Albert L. Stevens.....Schnectady, N. Y.
G. A. Briggs.....Boston, Mass.
William Tucker.....Chicago
Dr. D. Miller.....Murphy, Tex.
William Myers.....Dayton, O.
G. P. Albee.....Wellsley, Mass.

REGISTRATIONS AT LOS ANGELES

Los Angeles, Cal., Aug. 7—Many tourists are passing through here, both to and from the fairs. Some of those registering this week, one in each party being given, were:

W. W. Martin.....Shinglehouse, Pa.
W. D. Peterson.....Janesville, Wis.
W. J. Burgen.....Carnegie, Pa.
L. H. Williams.....Mountain Grove, Mo.
Paul Lewis.....Kansas City, Mo.

Motor Age's Road Condition Map—Changed Weekly



Straight Tips on Transcontinental Trails

Latest Reports on Road Conditions from Those Who Know

TELEGRAPH TIPS

LOS ANGELES, CAL., August 9—Special telegram—Recent rains have made the National Old Trails route muddy between Springer-ville and Sorocco, but roads are not impassable. The Ocean-to-Ocean highway is good between Globe, Ariz., and Roosevelt Dam. East of Globe the road is rough, but dry. Between Las Vegas, Santa Fe and Albuquerque, N. M., weather conditions have improved and traffic is being resumed. On the Lincoln highway the bulk of traffic is routing south at Ely, Nev., coming direct to Los Angeles, or as far south as Big Pine, thence north to San Francisco. California roads between the expositions are excellent except for a few miles of repair work on the Coast route near Santa Barbara and a few rough places over San Marco pass.—A. G. Waddell.

Baker, Ore., August 10—Special telegram—Road conditions on Yellowstone trail much better than I expected. Some sand in Wisconsin just east of Stevens Point. Mostly gravel from there to South Dakota state line. Excellent graded dirt from there to Missouri river. Fifteen miles very poor road across Indian reservation just west of river. Good graded road from there to Baker, Mont. Fairly good natural prairie road from Baker to Terry. Good graded road from there to Miles City. All of this dirt, especially across the Dakotas, is gumbo and very bad in wet weather. Miles City to Billings practically all graded along Yellowstone valley. West to Deer Lodge via Livingston and Butte, very good graded road. Especially good across the Continental divide; turns wide and banked; gradual grades not dangerous. Deer Lodge to Drummond, rough narrow road, rather poor. Drummond to Missoula, fair. Missoula to Alberton, very good. Alberton to Salt Lake good, except 15 miles which is very poor, rough, new road. Salt Lake to Wallace, excellent graded gravel road over summit of Bitter Root. Wallace to Coeur d'Alene very good. Beautiful scenery Coeur d'Alene to Spokane; fine natural macadam. Option of two routes Spokane to Seattle. One via Davenport, Vantage Ferry and Ellensburg. Caution tourists against using Blewett pass road. Route I covered across Washington is via Colfax, Walla Walla, North Yakima and Ellensburg. Mixture of fair to good roads with bad stretches between Walla Walla and Wallula. Excellent graded gravel roads over Cascade mountains with wonderful scenery into Seattle.—R. A. Woodall, Official Automobile Blue Book Road Scout.

Reno, Nev., August 9—Special telegram—The condition of Nevada roads from Ely west to Reno is good according to tourists arriving today over the Lincoln highway. Much travel is coming into Reno by way of the Overland trail. Both routes are dusty due to lack of summer rains. The Lincoln highway is good now near Fallon, where bad holes were previously reported. Between Reno and Truckee to Lake Tahoe the road is better than last year, but not particularly well maintained.—Spellier-Reinhart News Service.

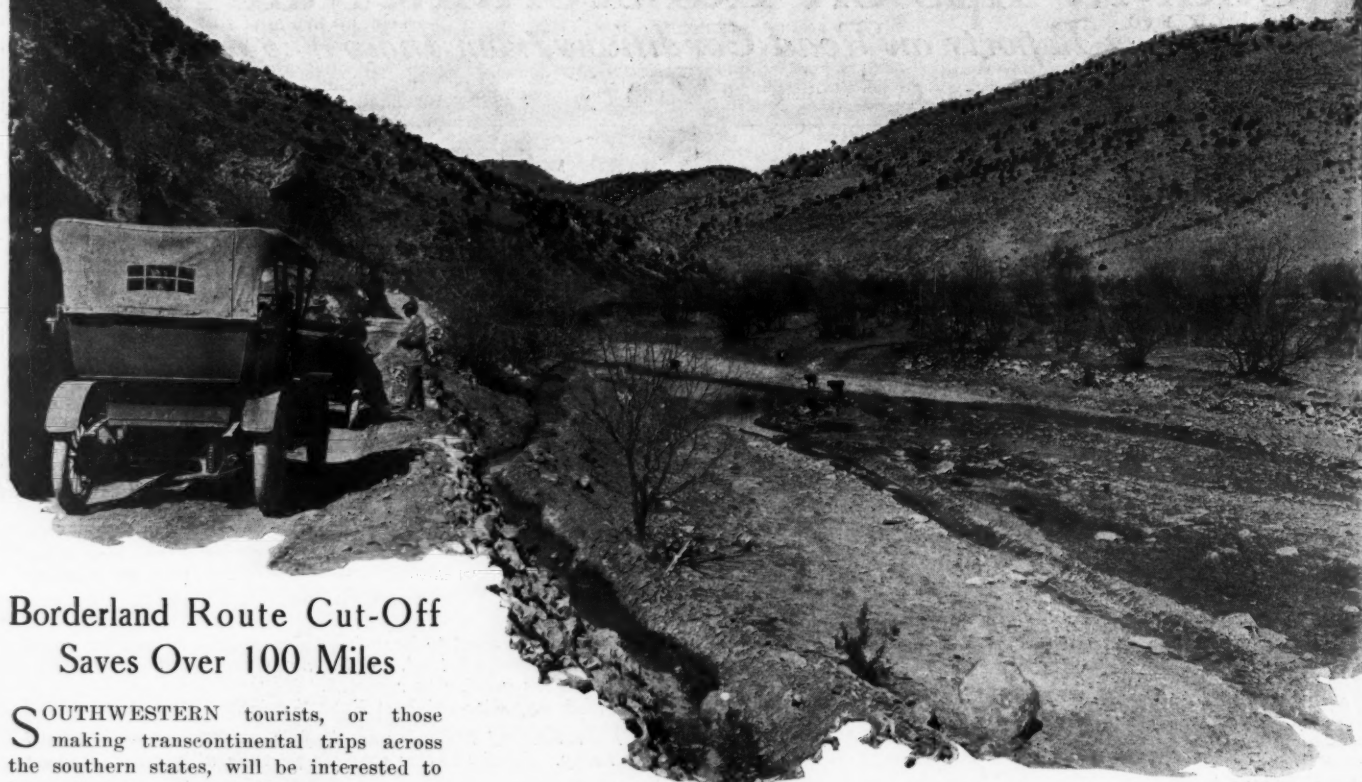
Cheyenne, Wyo., August 9—Special telegram—Roads through western Nebraska and Wyoming are in fair condition though somewhat rough from recent rains. They are drying rapidly, however, and traffic is heavy. Ideal summer weather prevails at present.—Cheyenne Motor Club.

Colorado Springs, Colo., August 9—Special telegram—All roads radiating from Colorado Springs are in good condition despite some rain. Colorado-to-Gulf highway generally good. Reports indicate that the Pike's Peak Ocean-to-Ocean highway is passable all the way from Indianapolis to Salt Lake City, with rapid improvement in Missouri and Kansas. Transcontinental travelers are pleased with road conditions and scenery on this route through Colorado and Utah.—A. W. Henderson.

Cody, Wyo., August 9—Special telegram—Motorists arriving over the Yellowstone highway from Cheyenne report road conditions better than they had expected to find them. The rains of 2 weeks ago damaged roads between Cheyenne and Douglas. However, it is reported that the damage has been repaired and roads are in fairly good condition. From Cody to Yellowstone Park the road is good, the government having spent nearly \$60,000 already this year on this route. Many refer to it as a boulevard. Fifty to sixty machines went through here to the park in the last week and tourists report the park regulations to be very satisfactory.—Cody Trading Co.

IOWA CITY	Aug. 9—Conditions on the Chicago, Kansas City and Gulf highway in Iowa are fairly good, considering heavy rains. There is a little mud in places, but in the main this route is good. In Illinois, southwest of Sterling, a cloudburst caused the Rock river to overflow. However, this part of the Chicago, Kansas City and Gulf highway will be good in a few days. The Red Ball route is being dragged and is in fairly good condition, which also is true of the River-to-river road. The Red Cross route is fairly good, but has some muddy spots at present.—Robert N. Carson, President Iowa Division, Chicago, Kansas City and Gulf Highway.
[Chicago, Kansas City and Gulf, Red Ball, Red Cross Routes]	
ALBUQUERQUE, N. M.	Aug. 7—Light rains along the National Old Trails and Ocean-to-Ocean highway through New Mexico have made the adobe sections a little slippery and require the use of chains, but are not impassable at any point. The road through Blue Canyon from Sorocco to Magdalena, has been reconstructed and is good. The rainy season should cease within the next week or 10 days through New Mexico and Arizona.—D. K. B. Sellers.
[National Old Trails and Ocean-to-Ocean Highways]	
ABERDEEN, S. D.	Aug. 7—The Yellowstone trail from Chicago to Seattle, in spite of heavy rains in July, is the best in the history of the road, taken as a whole. Every section is travelable at present and at good speed.—H. D. Cooley, Secretary, Yellowstone Trail Association.
[Yellowstone Trail]	
ST. JOSEPH, MO.	Aug. 7—Road conditions about St. Joseph are reasonably good. We have had 4 or 5 days of sunshine and all roads will have been dragged within a few days. Pike's Peak trail to Hlawatha, Kan., good; to the east, good, excepting Platte river bottoms, where there is some mud.—George E. McIninch, Second Vice-President, Pike's Peak Ocean-to-Ocean Highway Association.
[Pike's Peak Trail]	
ALEXANDRIA, MINN.	Aug. 9.—The Red trail to Fargo is good, excepting a short stretch near here. A bad section can be avoided by going from here to Wendell, then west to Nashua, turn north 1 mile, then west 6 miles to Campbell, Doiran, following the railroad tracks to Breckinridge, where one will strike the Black and Yellow trail. The worst part of the Red trail is in the vicinity of Fergus Falls.—George E. Stumpf.
[Red Trail and Black and Yellow Trail]	
OGDEN, UTAH	Aug. 7—Overland trail from here to Elko, reasonably good all the way, although due to the long dry spell there is considerable dust, with a few stretches that are chunky and rough. Tourists, however, recommend this route, since they eliminate the desert and are within easy reach of civilization all of the time. The Lincoln highway to Ely, Nev., good, with the exception of a few places where the road is rutted and some parts that are dusty.—J. David Larson, Secretary, Ogden Publicity Bureau.
[Overland Trail and Lincoln Highway]	
LIMON, COLO.	Aug. 6—Heavy rains on the road to Colorado Springs have washed out several culverts, but these are being replaced and road will be o. k. again by August 15. Road to Denver is rough in places.—G. W. Lewis, Limon Garage.
[Pike's Peak Trail]	
BILLINGS, MONT.	Aug. 7—Washouts caused by recent heavy rains in Montana all along the Yellowstone trail and National Old Parks highway are being repaired and motorists who have traveled over these routes within the last few days say they experienced little difficulty. They encountered but few stretches where road was muddy, but were forced to travel slowly in some places where small streams washed out the roadway.—R. C. Wright.
[Yellowstone Trail and National Old Parks Highway]	

Routes and Touring Information



Borderland Route Cut-Off Saves Over 100 Miles

SOUTHWESTERN tourists, or those making transcontinental trips across the southern states, will be interested to learn that a new cut-off has been established that shortens the distance from Lovington, N. M., to El Paso, Tex., 100 miles or more. This new road offers a convenient pass across the mountains for those who cross the continent in winter.

Beginning at Lovington, N. M., this cut-off runs through Artesia, Hope and on to El Paso. At Lovington it divides, the southern traffic branching off, via Seminole and Samesa, to Gail, Tex., connecting with the Borderland route there. Northbound traffic turns to the northeast from Lovington and strikes the Borderland route at Bronco, Tex., then branches off to Lubbock and on to Amarillo, Dodge City, Kan., and the northern routes.

This road has been open since last fall, or early winter, and was traveled continuously during the winter, notwithstanding that there was more rain and snow during that period than ever was known in any similar time in that section. This route passes through a gap in the mountains that never is blocked with snow. The elevation is 5,780 feet above sea level and is the lowest pass on the Rocky mountain range in the United States.

Tourists who visit the expositions late in the year will find this cut-off a material aid in returning during the winter months. It follows the points of least resistance and passes through a section that never is tied up with snow or from the effects of rain. The road is well marked, plenty of hotels and garages will be found, and con-



SECTION OF BORDERLAND ROUTE THROUGH BONITA VALLEY A SHORT DISTANCE WEST OF BRONCO, TEX. MAP AT LEFT SHOWS BORDERLAND ROUTE IN HEAVY LINE, WHILE THE LIGHT LINE SHOWS CUT-OFF

siderable time may be saved by taking advantage of this shorter route. The map herewith shows where to leave the regular Borderland route and the towns mentioned.

Some very picturesque points of interest will be found along this route, which carries a large percentage of the winter tourists across the continent.

PROTESTS AGAINST ROAD BODY

Minneapolis, Minn.—Editor Motor Age—As a member of the Yellowstone Trail Association I want to register a protest against the publication of articles similar to the leading one in your issue of July 15. credited to the trail association.

Apparently, the National Parks highway people are out to boost the state of Washington. Toward this end they have begun the advertising of an already established road between Chicago and Seattle, have renamed this road, claimed some things for it that do not exist, and totally ignore the fact that the major portion of the route has been improved and exploited entirely

by the 3-year-old Yellowstone Trail Association. Not content with this, they even have appropriated the recent relay run which you, in your columns, rightfully credited to the Trail association.

The Yellowstone Trail Association mapped out its route 3 years ago, marked it from one end to the other with the trail insignia, and has either spent or caused to be spent many, many thousands of dollars for its improvement. It has recently had the entire route thoroughly logged by the Blue Book and is trying by all legitimate means to encourage the transcontinental tourist to travel over its length. We believe, and not without reason, that we have decidedly the best road between the Mississippi river and the Pacific coast.

To have some new organization come along and try bodily to steal our already established road is, to say the least, rather trying. Investigation locally discloses no representative of the National Parks Highwayway Association, and I know personally that they have not marked a mile between Minneapolis and Yellowstone park over the route they call the southern route.

The Yellowstone Trail Association is not advertising any one state or section; we are working upon a transcontinental road.

How well we are succeeding is evidenced by the constantly increasing travel one meets daily at any point.—H. F. Marston.

Answers to Inquiries for Route Information

Evansville, Ind.-Nashville, Tenn.

B LOOMINGTON, ILL.—Editor Motor Age—Will you kindly give me the route from Evansville, Ind., to Nashville, Tenn., via Madisonville and Hopkinsville, Ky?—Enoch Brock.

There is a fairly good road from Evansville through Madisonville and Hopkinsville, Ky., although Motor Age does not know its condition at present. A road, alternating between fine macadam to rough clay, extends from Hopkinsville to Nashville, a distance of 89 miles, running through Clarksville and Cedar Hill.

Cleveland, O.-Chicago

Cleveland, O.—Editor Motor Age—Will you kindly give me the best route from Cleveland to Chicago?—A. F. Lumberg.

Drive 120 miles to Toledo, via Elyria, Oberlin, Norwalk, Bellevue and Fremont, over good roads alternating brick to macadam all the way. At Toledo continue west to South Bend, Ind., over good gravel or stone roads all the way. This will take you through Wauseon, Bryan, O., Ligonier, Ind., and Goshen. A new route from South Bend to Chicago has been laid out owing to improvement work under way in the vicinity of Michigan City and LaPorte.

Leaving South Bend, drive 33 miles to New Buffalo. Continue on to Grand Beach, then through Michigan City, Furnaceville, Crisman, Hobart, South Gary, Highlands, Hammond. Drive west from Hammond to Burnham, turning north a short distance west of the Arrow Head Inn and follow the Green Bay road to the end—106th street—then turn east three blocks to Ewing avenue, thence north through South Chicago to destination.

Bloomington, Ill.-Sanborn, Ia.

Lexington, Ill.—Editor Motor Age—Kindly give me the best route from Bloomington, Ill., to Sanborn, Ia., also the condition of the roads in August and September.—Clement Geiger.

Drive north 110 miles through Gridley, Streator, Ottawa and Pawpaw to Rochelle, 112 miles, over good dirt and gravel road. At Rochelle pick up the Lincoln highway, and follow the red, white and blue bands to Denison, Ia., a distance of 380 miles through Dixon, Sterling, Clinton, Wheatland, Cedar Rapids, Belle Plaine, Montour, Marshalltown, Ames, Boone, Jefferson and Carroll to Denison.

Leave Denison and go north 88 miles to Spencer, over dragged roads through Deloit, Odebolt, Storm Lake, Truesdale, Sioux Rapids to Spencer. Sanborn is 29 miles directly west of Spencer.

The roads should be in good condition during August and September, barring rains.

Milwaukee, Wis.-Sinsinawa, Wis.

Milwaukee, Wis.—Editor Motor Age—How many miles is it to Sinsinawa, Wis., from Milwaukee? Give me the best route and what are the road conditions? Does one have to go to Dubuque to reach there?—M. H. Teasley.

The distance, in round numbers, is about 175 miles. You have the choice of two routes: 1—From Milwaukee through Waukesha, Elkhorn and Beloit to Rockford, and thence through Freeport to Hazel Green. Sinsinawa is just a short distance west of Hazel Green. 2—From Milwaukee via Oconomowoc and Watertown to Madison and thence via Dodgeville, Mineral Point and Calamine to Cuba. Sinsinawa is but a short distance southwest of Cuba. It is not neces-

sary to go first to Dubuque to reach Sinsinawa. The road from Milwaukee to Rockford is good gravel practically all the way. From Rockford to Freeport old macadam, badly in need of repair. Mostly good dirt and gravel to Warren, and from there on over very hilly country on clay soil. From Milwaukee to Madison, mostly gravel, although Tiffin to Fostoria, over good roads, mostly macadam.

Akron, O.-Fostoria, O.

Akron, O.—Editor Motor Age—Can you favor me with information regarding the best route from Akron, O., to Fostoria, O?—J. L. Brown.

Mostly macadam with some good hard dirt road will be found in the 62-mile stretch from Akron to Norwalk. This will take you through Medina, Belden and Wakeman to Norwalk, where you strike the Cleveland-Toledo road, which you should follow to Bellevue, then turn south and drive 35 miles though there are one or two only fair dirt stretches between Oconomowoc and Madison. From Madison on, mostly good, natural dirt over rather hilly country. For

running directions for this trip, see Volume 4 of the Blue Book.

Cleveland-Philadelphia

Muncie, Ind.—Editor Motor Age—Will you kindly advise the best route from Cleveland, O., to Pittsburgh, Pa., thence to Philadelphia?—E. T. Hanley.

Drive to Bedford, 11 miles, then through Stow Corners, Kent, Ravenna, Alliance, Salem, Unity, O., Darlington, Pa., Beaver Falls, Rochester, Sewickley and Bellevue to Pittsburgh, a total distance of 146 miles, over roads alternating between brick, macadam and good gravel.

From Pittsburgh bear southeast to Bedford, 97 miles. The road is macadam nearly all the way; hilly in some sections but easy grades. Fine views are afforded on the mountains and this road offers an exceptionally pleasant trip. This route takes you through Greensburg, Ligonier, Schellburg and Wolfburg.

Next drive to Harrisburg, 106 miles, over good pike most of the way, via McConnellsburg, Chambersburg, Shippensburg and Carlisle. All good macadam pike will be found in the 101-mile stretch from Harrisburg to Philadelphia. You should drive through Middletown, Elizabethtown, Mt. Joy and Lancaster.

Shreveport, La.-Parsons, Kan.

DeRidder, La.—Editor Motor Age—Will you kindly inform me as to the best motor roads from Shreveport, La., to Parsons,



VIEW SHOWING SECTION OF BORDERLAND ROUTE IN NEW MEXICO

Kan., condition of roads, etc?—James D. Toy.

Drive west to Dallas, Tex., through Greenwood, La., Longview, Tex., Gladwater, Starville, Winona, Tyler, Edom and Willspoint, about 250 miles, over fair-to-good roads. At Dallas turn north, going to Denison, Tex., 84 miles over the Oklahoma, Texas and Gulf highway. This road, which is good dragged dirt all the way, passes through McKenney, Van Alstyne, Howe and Sherman. Keep straight through Denison on the Oklahoma, Texas and Gulf highway to Oklahoma City, 194 miles. This is a natural dirt road, is kept up by dragging, but will be found good or bad, according to weather. It takes you through Milburn, Mill Creek, Wynnewood, Lexington, Nobel and Norman.

Continue north from Oklahoma City to Arkansas City, Kan., 137 miles, mostly rolling and slightly hilly country. This section has fairly good dirt roads. Effort is made to keep this part of the Oklahoma, Texas and Gulf highway in good condition by dragging, but there are occasional bad stretches. You should pass through Edmond, Guthrie, Orlando, Perry, Ponca City and Newkirk, Okla.

Motor Age has no record of an established route from Arkansas City to Parsons, Kan., which lies about 115 miles east. However, by making local inquiry, you probably can get information as to the best route. If you are making a leisurely jaunt, perhaps you would rather keep on established trails all the way, in which case you could go in a roundabout way to Parsons, the distance being about 275 miles. This route would take you north from Arkansas City to Florence, 97 miles, through Winfield, Eldorado and Burns; then east over the Santa Fe trail, 103 miles, to Ottawa, passing through Emporia. At Ottawa turn south again going 45 miles to Canute, which is only a few miles northwest of Parsons.

Volume 5 of the Blue Book will give running directions.

Wakefield, Kan.-Tampa, Fla.

Wakefield, Kan.—Editor Motor Age—Kindly give me the best route from Wakefield, Kan., to Tampa, Fla.—J. T. Bradbury.

A good dry weather route would be to go east to Manhattan and from this point follow the red, orange and black bands for 66 miles through Wamego and Silver Lake to Topeka, Kan.; good dirt and gravel road, and through Lawrence, DeSoto and Shawnee to Kansas City, 76 miles.

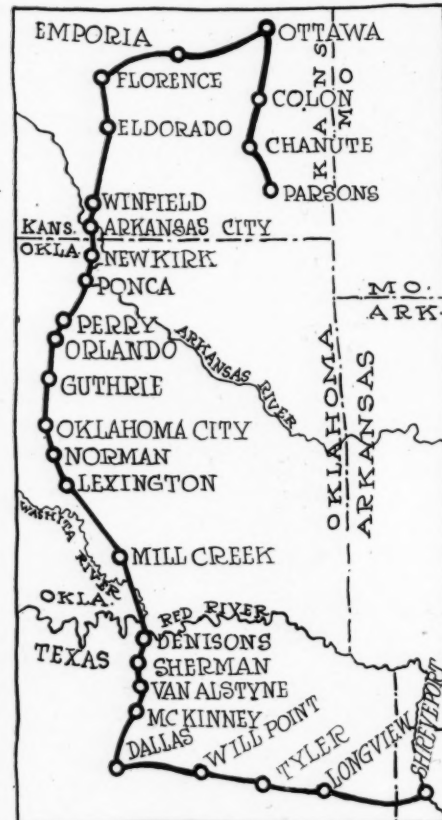
From Kansas City route to St. Louis, Mo., via Blue Springs, Odessa, Marshall, Glasgow, Mexico, Wellsville and New Florence to St. Louis, 312 miles. Proceed next to Vincennes, Ind., 155 miles, via Belleville, Salem and Olney; thence to Louisville, Ky., 129 miles through Washington, Shoals and Orleans.

Leave Louisville and go south 124 miles via Columbus and Seymour. Gravel to Uniontown; mixture of dirt and gravel balance of the way. From Louisville drive 102 miles to Cave City via Mt. Washington, New Haven, Buffalo, Bear Wallow, thence to Nashville, Tenn., through Glasgow, Scottsville and Gallatin, 103 miles over fair roads except the last 23 in Kentucky.

To reach Chattanooga drive 247 miles through Murfreesboro, Huntsville and Jasper; then 136 miles via Lafayette, Rome and Marietta to Atlanta. A drive of 96 miles through Jonesboro, Griffin and Forsyth will bring you into Macon, and 149 miles via Vienna, Tifton and Adel to Valdosta, Ga. Next go through Lee and Falmouth to Live Oak, 57 miles. From Live Oak swing south down through O'Brien, Fort White, Gainesville, Ocala, Inverness, Drexel and Stempers to Tampa, 162 miles.

If the excessive rains of the present season continue, then your routing should be to Des Moines, Chicago and Fort Wayne, then through Pittsburgh, Hagerstown, Staunton, Roanoke, Winston-Salem, Atlanta and Live Oak. The routing from Chicago is as follows:

From Chicago, Ill., to Fort Wayne, Ind.—good in dry weather—via South Chicago, Ill., Hammond, Ind., Highlands, Hobart, Valparaiso, Donaldson, Plymouth, Warsaw, Columbia City. From Fort Wayne, Ind., to Lima, O.—over a section of the Lincoln highway—via New Haven, Ind., Van Wert, O., Delphos. From Lima to Canton, O., via Ada, Upper Sandusky, Bucyrus, Galion, Mansfield, Olivesburg, Ashland, Wooster, Massillon. From Canton, O., to Pittsburgh, Pa., via Louisville, Harrisburg and Alliance.



ROUTE MAP SHREVEPORT, LA.-PARSONS, KAN.

From Pittsburgh to Bedford, Pa., via Wilkinsburg, Greensburg, Ligonier and Wolfburg. From Bedford, Pa., to Hagerstown, Md., via Everett, McConnellsburg, Mercersburg and Greencastle. From Hagerstown, Md., to Staunton, Va., via Williamsport, Md., Martinsburg, W. Va., Bunker Hill, W. Va., Winchester, Va., Stephens City, Middletown, Mount Jackson, Harrisonburg, Mount Sidney to Staunton. From Staunton to Roanoke, Va., via Greenville, Midway, Fairfield, Lexington, Natural Bridge, Buchanan, Cloverdale to Roanoke. From Roanoke, Va., to Winston-Salem, N. C., via Rocky Mount, Sydnersville, Oak Level, Martinsville, Ridge-way, Va., Stoneville, N. C., Ellisboro, Kernersville. From Winston-Salem to Lexington, N. C., via Midway, and Brinkleys. From Lexington to Charlotte via Salisbury, Landis, Concord and Newell. From Charlotte, N. C., to Greenville, S. C., via Sloane's Ferry, Belmont, Gastonia, Bessemer City, Grover, N. C., Blacksburg, S. C., Gaffney, Converse, Spartanburg and Greer. From Greenville, S. C., to Atlanta, Ga., via Oak Grove, Anderson, Fair Play, S. C., Lavonia, Ga., Franklin Springs, Pocatigo, Law-

renceville and Decatur. From Atlanta to Macon, Ga., via Jonesboro, Pomona, Barnesville and Lorane. From Macon to Valdosta, Ga., via Vienna, Sycamore, Lenox, Hahira and Mineola.

Independence, Ia.-St. Paul, Minn.

Independence, Ia.—Editor Motor Age—Please give me the route and distance to St. Paul, Minn., from Independence, Ia., by way of Dubuque, staying as close to the Mississippi river as good roads will permit. Also best roads direct from St. Paul to Independence.—H. Tabor.

Drive east to Dyersville, 44 miles, over good roads, passing through Manchester. It is 22 miles to Dubuque, but the road to St. Paul turns north at Dyersville, so if you go to Dubuque, you will have to retrace your way as far as Dyersville. Here turn north, driving 168 miles to LaCrosse, Wis. This road is somewhat hilly but offers a good view of surrounding country. Route through Guttenberg, McGregor, cross river on ferry to Prairie du Chien, then through Mt. Sterling, Liberty Pole, Viroqua and Portland.

Next drive to St. Paul via La Crescent, Minn., Witoka, Winona, Lewiston, Utica, Rochester and Canon Falls. This route is a mixture of long level stretches, with some rolling country and one or two rather long grades before reaching Winona.

The direct route to Independence from St. Paul takes you over fair-to-good dirt roads with some gravel, through Rosemount, Farmington, Castle Rock, Northfield, Dundas, Medford, Blooming Prairie, Lansing, Austin, Lyne, Minn., St. Ansgar, Ia., Osage, Charles City and Janesville to Waterloo, 210 miles. Then east to Independence.

Running directions will be found in Volume 5 of the Blue Book, published by the Blue Book Publishing Co., 910 South Michigan avenue, Chicago. Price \$2.50.

Monmouth, Ill.-St. Louis, Mo.

Monmouth, Ill.—Editor Motor Age—I would like to know the best route from Monmouth, Ill., to St. Louis, Mo., and from St. Louis to Des Moines, Ia.—C. R. Unkrich.

First drive 73 miles to Keokuk, over fair dirt road, passing through LaHarpe, Burnside and Hamilton. Next go 37 miles to Quincy, part dirt and part gravel, via Hamilton and Ursa. Generally good roads will be found on the 119-mile stretch to St. Louis. Route through Marblehead, Hannibal, Mo., New London, Frankford, Flint and St. Charles.

To go to Des Moines retrace your route to as far as Keokuk. Here cross the Mississippi and drive through Donaldson to Houghton, then turn northwest going through Hillsboro, Stockport, Fairfield, Batavia and Agency to Ottumwa. At Ottumwa turn north and drive to Fremont, thence west to Cedar and then northwest to Des Moines, via Oskaloosa, Pella, Monroe and Prairie City.

Volumes 4 and 5 of the Blue Book give running directions.

Rockford, Ill.-Sioux Falls, S. D.

Rockford, Ill.—Editor Motor Age—Will you kindly give me a layout of the most direct and best route from Rockford, Ill., to Sioux Falls, S. D.?—Charles W. Yeager.

Drive west 95 miles to Dubuque, via Freeport. The section of road between Rockford and Freeport is hilly, mostly is macadamized, but in need of repair. The remainder of the way is fairly good. About 12 miles west of Freeport you will pass the spot on which the last great battle of the Black Hawk war was fought. This is marked with a monument. You should pass through Nora, Warren, Ill., Shullsburg, Wis., Leadmine and Hazel Green.

Continue west from Dubuque to Waterloo, Ia., over good level dirt roads all the way except a short stretch out of the Mississippi valley, which is hilly. This 90-mile stretch



The Readers' Clearing House



OPERATION OF BOSCH DUAL SYSTEM Tracing the Path of the Current on Battery and Magneto

EUREKA, ILL.—Editor Motor Age—Please give me wiring diagram and information on the action of the Bosch dual system of ignition.—Ed Buchwalter.

In Figs. 1, 2, 3, and 4 is shown the Bosch dual ignition system, with the three switch positions, and the current flow in each. Let us first see what happens when the switch is thrown on the battery side, as shown in Fig. 3. The current in the battery, B, leaves it at the positive side and travels through the ground wire, G, which is attached to it. It goes then, through the breaker points, BP, which are operated by a cam. The course then is to the post 1, through the mechanism, X, in the direction of the arrows, to point, S. It flows then through the primary winding, P, of the coil, and as the arrows show through point 5 back to the battery. Thus the primary battery circuit is complete. In passing through the primary winding, a high-tension current is set up in the secondary winding, SW, when the breaker points separate. This high-tension current flows to the distributor wire at 4 and thence to the magneto distributor, MD. Here it is passed to the different spark plugs in order. It goes through the plug to the base of the cylinders to ground. However, one end of the high-tension winding is grounded. Therefore the current flows back to the high-tension winding, where it was induced, by means of the ground wire. This completes the battery system of the Bosch dual system. C, in Fig. 3, represents the condenser. In Fig. 4 the outside wire of the battery system is made clear. The current leaves the battery at the positive terminal and travels to the ground. As 6 is grounded the current goes to 6, thence to 2 and along 2 to the magneto. Then to 1 on the magneto, and along the wire as indicated by the arrows to the point 1 on the switch plate. Here it travels through the primary winding of the coil, then to 5 and back to bat-

tery as before, thus completing the circuit. A thing that is very confusing in this, is that the cover plate or plate with the marks 1, 2, 3, 4, 5, and 6 in Fig. 4 may be taken for the coil end in Fig. 3. The cover plate in Fig. 4 remains stationary. When the switch is turned the

HORSEPOWER TABLE

Bore in inches	Four	Six	Eight	Twelve
2 1/2	10.00	15.00	20.00	30.00
2 5/8	11.23	16.85	22.46	33.70
2 3/4	12.08	18.13	24.16	36.23
2 7/8	13.37	20.00	26.74	40.00
3	14.40	21.60	28.80	43.20
3 1/8	15.64	23.50	31.28	47.00
3 1/4	16.92	25.39	33.84	50.78
3 3/8	18.21	27.30	36.42	54.60
3 1/2	19.61	29.45	39.22	58.90
3 5/8	21.08	31.57	42.16	63.14
3 3/4	22.50	33.75	45.00	67.50
3 7/8	24.22	36.32	48.44	72.64
4	25.60	38.40	51.20	76.80
4 1/8	27.20	40.80	54.40	81.60
4 1/4	29.00	43.50	58.00	87.00
4 3/8	30.65	46.00	61.30	92.00
4 1/2	32.40	48.60	64.80	97.20
4 5/8	34.28	51.41	69.56	102.81
4 3/4	36.15	54.20	72.30	108.40
4 7/8	38.25	57.21	76.50	114.42
5	40.00	60.00	80.00	120.00
5 1/8	42.20	63.20	84.40	126.40
5 1/4	44.20	66.40	88.40	132.80
5 3/8	46.34	69.50	92.68	139.00
5 1/2	48.48	72.72	96.96	145.44
5 5/8	50.80	76.10	101.60	152.20
5 3/4	53.00	79.50	106.00	159.00
5 7/8	55.28	83.88	110.56	167.76
6	57.70	86.64	115.40	173.28

whole mechanism in Fig. 4 with the marks 1, 2, 3, 4, 5 and 6, moves. When the switch is thrown on the battery side the point 1 on the cover plate lines up with the 1 on the coil, likewise 2 and 5. In reality they are brass busbars or segments. On the cover plate the numbers

represent binding posts for the wires.

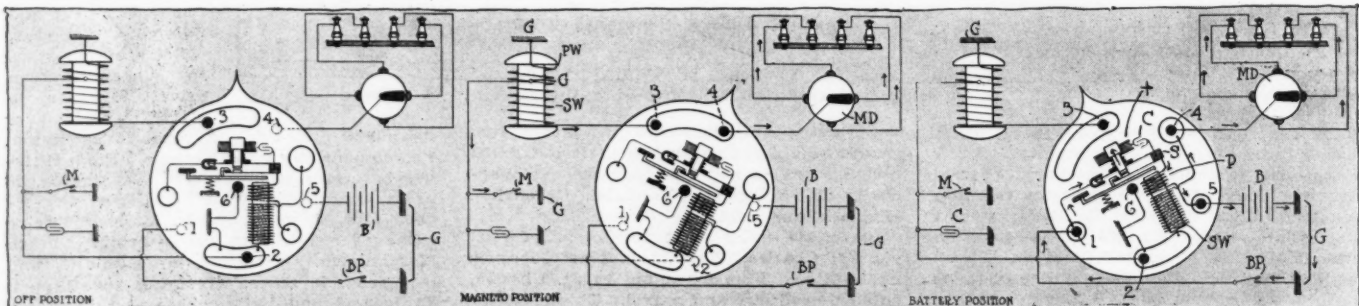
In the off position of the switch, Fig. 1, there can be no circuit because the points 1, 2, 5, and 4 of the plate do not coincide with points 1, 2, 5, and 4 of the coil. All the circuits are open really.

As soon as the switch is thrown on the magneto side, the busbar with which 3 is in contact in Fig. 3, connects also 4. But the other points are out of line. In other words the only complete circuit is through 3 and 4. Now, the magneto is turning around and a low-tension current is set up in the primary winding, PW, of the magneto. This current flows through a wire to M, the magneto breaker points and from there to the ground G. But the other end of the primary winding of the magneto coil is grounded, therefore the circuit is complete. In passing through the primary winding, the current induces a high-tension current in the secondary winding, SW, which goes immediately to 3. But 3 and 4 are connected by the brass busbar, therefore the current will flow from 3 to 4. The latter has attached to it the distributor wire. The current will flow then through the distributor wire to the magneto distributor board, MD, and thence to the spark plugs. Here the current is grounded. The other end of the high-tension winding is grounded also, again the circuit is complete. In throwing the switch to magneto every circuit but that made by 3 and 4 is open.

MISFIRES WITH RETARDED SPARK Probably Caused By Dirt or Oil on Interrupter Points of Magneto

Chicago—Editor Motor Age—I am having trouble with grease coming out of my rear right wheel. I have put in new felt washers and a new gasket on, but the grease still leaks out around the plate on the wheel. My car is a model H Hupmobile 1913 with a floating axle. Could a little play on the wheel bearing cause this trouble? The differential housing has only enough grease for the gear to dip. Is there any difference in the two shafts in the rear axle of this car?

2—I have a Bosch magneto and with a retarded spark the motor hits very irregularly. Could this be caused by poor adjustment of breaker points? If so, please advise me as to the proper adjustment of the points on this



BOSCH DUAL SYSTEM SHOWING PATH OF CURRENT ON BATTERY AND MAGNETO

Fig. 1—With the switch in off position the points 1, 2, 4 and 5 are not in contact, thus opening all circuits

Fig. 2—With the switch in magneto position there is but one closed circuit and it was made by connecting 3 and 4

Fig. 3—Switch in battery position, showing points 3 and 4 not connected, thereby opening the magneto circuit

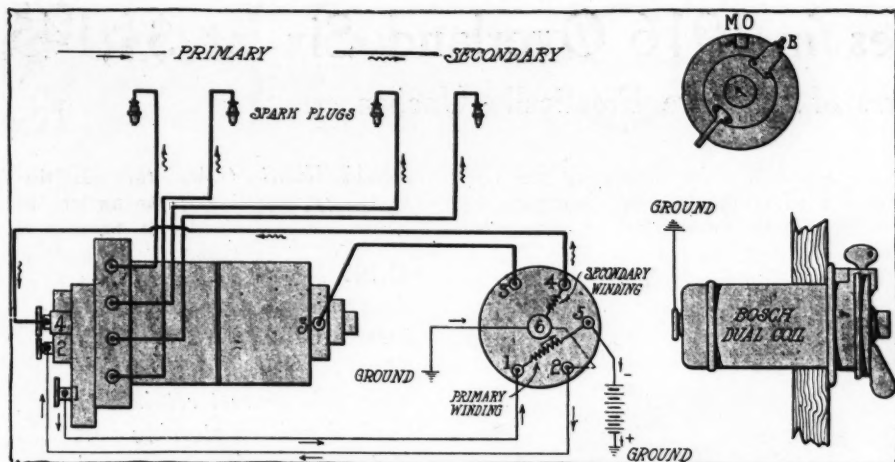


FIG. 4—OUTSIDE WIRING DIAGRAM OF THE BOSCH DUAL SYSTEM

Here the switch is on battery side, thus opening the magneto circuit made by 3 and 4

car and the means of telling when points become arched or otherwise defective.

3—Kindly give the proper pronunciation of the names F-I-A-T and Peugeot.

4—My Hupmobile has been overhauled recently and all the bearings tightened, new wrist pins put in and the valves ground. Now it makes a noise which sounds like a valve slap. The repairmen assured me that my push rods were in good shape as I asked him about this, having this same noise previous to the overhauling. I do not think it is a loose bearing because it is not any worse when the motor is speeded up and then idled. Can Motor Age give any clue to my bothersome troubles?—G. W. Davis.

1—The best you can do to stop the leakage is to gasket the plate on the wheel using a paper gasket. Wheel bearing play would not cause the trouble. The shafts are alike.

2—The trouble hardly is caused by poor adjustment or burned points for if it were there would be irregular firing at practically all speeds. Motor Age believes your trouble is due to dirt or oil on the points and a few drops of kerosene soon will remove this.

3—Fiat, is pronounced Feeat and Peugeot, Poijo. In the latter the j is soft.

4—If the noise sounds like a valve slap one hardly can expect a bearing to be loose. A loose bearing knock not only is louder but the sound is denser and not so metallic. The sound you speak of may be a valve slap which has returned. Turn the valves around on their seats as this may stop the slapping. Look around the motor for some small part which is loose. Often vibration causes some part to slap against another metallic piece.

POINTS AGAINST THE UNDERSLUNG Not Used On Any Modern Racing Cars

—Chain Drive Features

Minneapolis, Minn.—Editor Motor Age—Why do the racing cars all have overslung frames?

2—Is there any objections or faults to the underslung frame construction? Would the underslung construction cause skidding for fast

racing cars? It appears to me that this construction would make the car more apt to skid on account of the weight being below center.

3—Is every part of a racing car made of a special grade of steel or is just the steering parts, axles and spindles the special steels?

4—Why cannot the American racing car builders produce a car that has the staying qualities of the foreign makes for a long race?

5—Does the chain drive racing car like Ralph de Palma's Mercedes have any advantage over the shaft drive?—A. W.

1—The disadvantages of the underslung frame, as mentioned below, are such as to make the overslung form preferable for racing.

2—The frame being underneath the axles, there is a tendency, especially in the rear, for the frame to strike the axle in rough going owing to the small play allowed for movement. Underslung construction calls for large wheels with their tendency to become weak in a short while. This causes wheel wobbling and is characteristic of cars with large wheels which have been in service for some time and is not apparent on cars with smaller wheels.

With the underslung frame there is a tendency to side slip on turns. In some constructions seen in the past some of the car units were inaccessible and the tonneau floor was not flat but contained a dais to allow of rear axle movement.

3—In cars built strictly for racing, such as the Stutz, Mercedes, Mercer, etc., alloy steels of special composition are used practically throughout, but in some cars only such parts as you mention are made of alloy steels.

4—The American builders are a little behind the foreigners in the art, but from present indications our designers soon will outclass their brothers across the sea.

5—In chain driven cars there is less shock delivered to the motor due to clutch grabbing and sudden impact of the wheels and the road, owing to its greater flexibility, than the shaft drive. It is difficult to properly lubricate the chains and if they are inclosed in a case there is a barrier in getting a case which will hold oil and not interfere with chain operation.

Redesigned a 1910 Buick

Pontiac, Mich.—Editor Motor Age—Having rebuilt a 1910 Buick model 10, I have become interested in the made-over car stories in Motor Age. In Fig. 5 are two views of my car, the lines of which I secured from different cars shown in Motor Age. After a garage fire I purchased what was left of a Buick model 10 for \$20. I bought an Oakland radiator and a Jacox steering gear complete for \$15. The body and hood, I built out of 20-gauge sheet steel. The moulding used for the shroud was the tire from an old buggy wheel. I lengthened the frame 15 inches and used a Buick model 33 third member. This gave a wheelbase of 104 inches, which made for easy riding. I have obtained a speed of 56 miles an hour. I use a 120-hour storage battery for lighting, which lasts about 3 weeks on one charge. I use 31 by 3½ tires. The cost of rebuilding was \$190. I have made two trips over the Alleghany mountains, one to Washington, D. C., and another to Atlantic City, N. J.—Vincent C. Borer.

Cadillac 1910 Model Called the 30

Paducah, Ky.—Editor Motor Age—In your issue of July 8, 1915, page 33, you state that 9 to 11 miles per gallon of gasoline is a good average for the 1911 Cadillac. I believe 10 to 15 miles is nearer correct over the United States generally.

On page 28 of the same issue, Motor Age states that Mr. Howe used 26 gallons of oil in his 1910 model K Cadillac in traveling 3,432 miles. The 1910 Cadillac is called a 30 while the K was made back in 1906-1908. As to the oil, I believe a 1910 Cadillac will give 700 to 1,000 miles per gallon.—John R. Oakes.

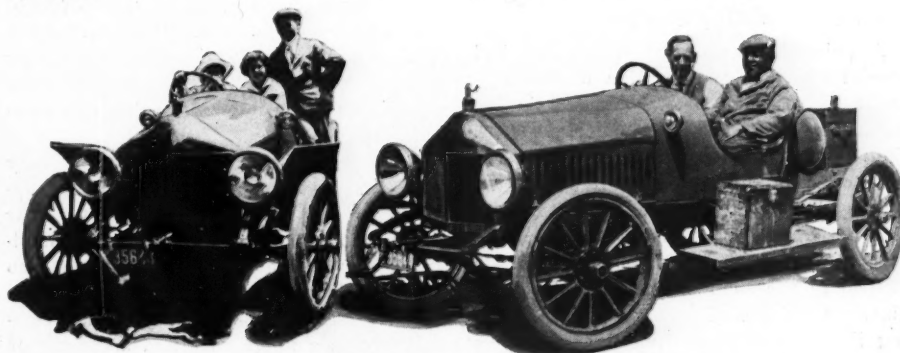


FIG. 5—A 1910 BUICK AFTER BEING REDESIGNED

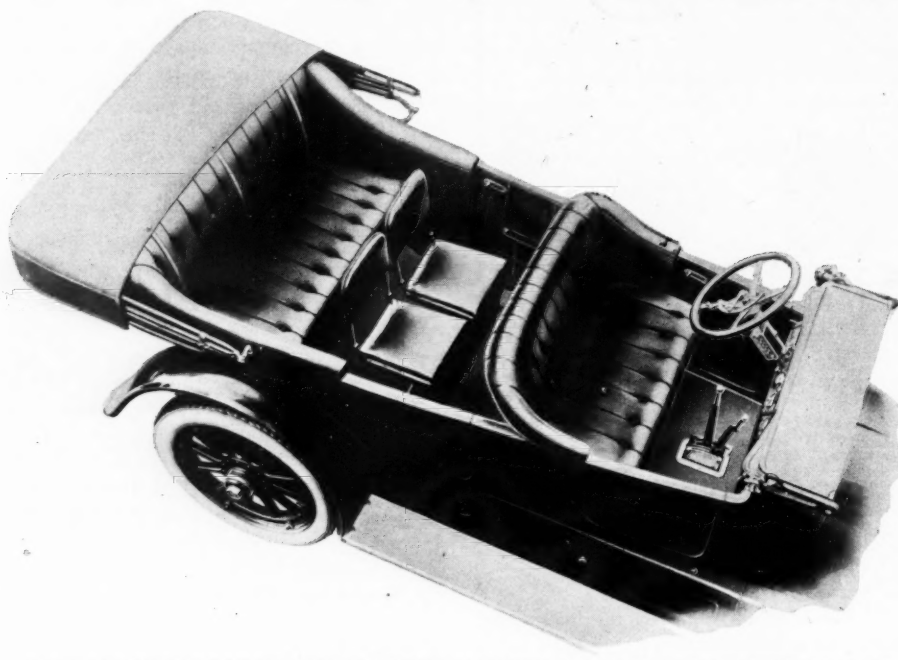
The radiator is from an Oakland and many parts are from other cars. The cost of redesigning was \$190

Questions Answered and Communications Received

Ed Buchwalter.....Eureka, Ill.
G. W. Davis.....Chicago, Ill.
A. W.....Minneapolis, Minn.
Vincent C. Borer.....Pontiac, Mich.
John R. Oakes.....Paducah, Ky.
No communication, not signed with the reader's full name and address, will be answered.

Many Motor Changes in 1916 Overland Six at \$1,145

Body Features of 1915 are Practically Unchanged



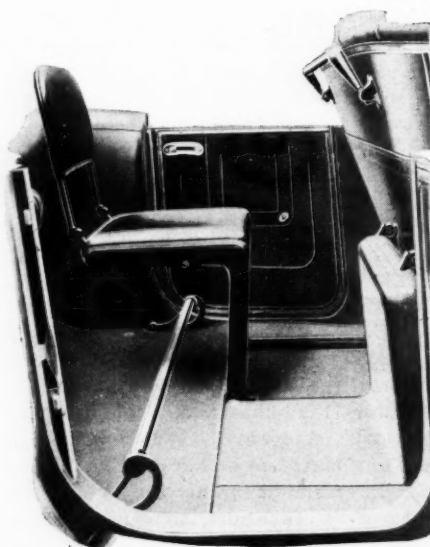
INTERIOR OF BODY OF SEVEN-PASSENGER 1916 OVERLAND SIX WHICH LISTS AT \$1,145

THE 1916 Overland six with seven-passenger body, with an improved block-cast motor the same size as used this year, with a wheelbase of 125 inches the same as this year, with 35 by 4½-inch tires, and with many other alterations, sells at \$1,145, or \$330 lower than its price for the season just closed. For 1916 this model will be built on a schedule basis of 7,000 and upwards. The new job has as its main characteristics a smooth-performing motor, ample power, excellent acceleration, a large roomy body, particularly good springs and conspicuous accessibility. The car is quiet in operation and one model, which has covered over 12,000 miles in factory testing, a distance equal to a year's performance, is still very quiet.

Its standard equipment includes a spare demountable rim, non-skid rear tires, one-person top, the usual accessories and a windshield which can be laid flat or otherwise and can be manipulated as readily with the top either up or down.

Control Accessibility Studied

A point in the design which has had special study is the location of the controls. Thus the accelerator pedal is the natural resting place for the right foot, the right hand rests easily upon either the gear or emergency brake levers and the lamp and ignition switches are all together in a little control box clipped to the steering column. The speedometer dial is central in the cowl board, flanked by the ammeter and the oil pressure gauge, all being illuminated by a dash light which is always burning when the headlights are in use with or without the dimmer. It may be added that all the switches can be



EXTRA SEAT IN POSITION IN OVERLAND SIX

locked by a turn of a key at the bottom of the control box, so preventing interference with any circuit. For operating the starter there is a toe button, as the Bendix drive needs only a switch action for its complete operation.

The springs are good and their easy action is aided by an ample depth of upholstery, but the long three-quarter rear springs do not create much roll when rounding a curve at high speed, and it is also noticeable that the rebound is slight. For this reason it is possible to sit back comfortably on a rough road and make use of the leg room. In the tonneau there is length enough to accommodate both the rear passengers and those on the folding

FEATURES OF THE 1916 OVERLAND SIX

Seven-passenger reduced to \$1,145

Accessibility one of main features

Three clutch springs now used

Raer axle gearset retained

Control unit on steering post

Motor accessories rearranged

Block motor, 3½ by 5¼

Helical timing gears adopted

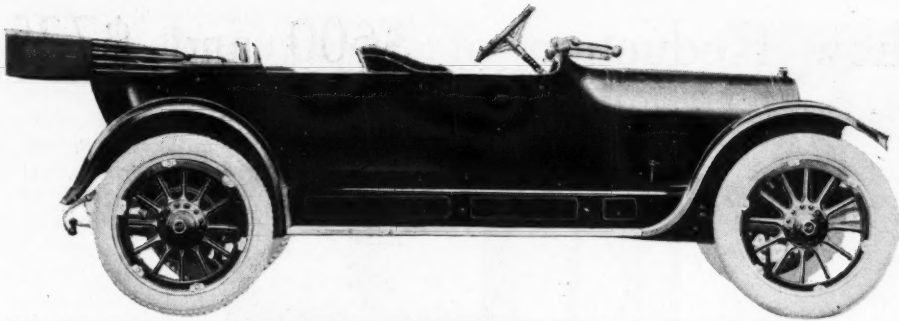
seats without any cramping, while setting the small seats towards the middle of the tonneau clears the doors of obstruction. The high sides and the straight line of the body are well shown in the illustrations, which also do justice to the smoothness obtained by the concealed hinges and inside door handles. Great attention is paid to the rigidity of the fenders and running boards; in fact, it is possible to stand on a fender and rock the car on its springs without producing any deflection on the fender itself.

Motor Changes Are Many

The motor is considerably different from that of the past season, although its cylinder measurement, 3.5 by 5.25, remains unaltered, giving a displacement of 303 cubic inches and a horsepower rating of 29.4. It still remains an L-head block casting but has an entire rearrangement of the various components due to the cross shaft at the front from which generator, magneto, water pump and fan were driven being discontinued and spiral gears being used instead, as shown in the end illustration. Due to this basic change of component drive water pump, generator and magneto are located in one line on the right with the fan driven from this side also. On the left are two units, the starter immediately in advance of the flywheel and the carbureter high up on the cylinder casting.

Good Arrangement of Parts

Accessibility must be watched for in the arrangement of components and the location of generator and magneto is such that they are low enough to clear the valves of obstruction. The accessibility is actually better than it appears, as the generator stands well away from the side of the crankcase, giving room for the manipulation of a tappet adjusting spanner. The use of leather disk couplings between pump and generator and between generator and magneto entirely prevents noise in the drive and also eliminates the possibility of slack arising, which is important in a tandem drive, for any lost



THE 1916 OVERLAND SIX IN WHICH ACCESSIBILITY HAS BEEN WATCHED FOR IN THE ARRANGEMENT OF THE COMPONENTS

motion between the front end pinion and the magneto would necessarily affect the timing of the ignition. In the valve side view of the engine the large exhaust pipe is noticeable. This has a vertical division inside, extending from about the middle of the length right back to a point just above where the exhaust pipe is attached. The purpose of this division is to separate the discharge from the three front cylinders so that exhaust strokes take place on alternate sides of the division, the idea being to prevent interference which might create back pressure.

The reverse side of the motor bears the new carbureter and the starting motor, the former being a special form of horizontal instrument attached directly to the cylinder block where it is extremely accessible. All the air for the carbureter is drawn right through the cylinder casting, entering at a hole concealed by the exhaust manifold and reaching the carbureter by the curved pipe seen in the reproduction. It should be noticed that the starting motor is placed high up, where it is out of the way of dirt, and the Bendix drive is accessible for the occasional lubrication which it needs. On this side of the motor, also, are the oil filling cap and the level indicator, so all the ordinary needs of the motor can be attended to by raising only one side of the hood.

Overland Lubricating System

Lubrication is a combination of force and splash, a plunger pump operated from the camshaft sending high pressure to the main crankshaft bearings, the pump shaft bearing and the timing gears. Troughs catch the overflow and dippers on the connecting rod caps distribute spray to all

parts of the motor. A large diameter shaft and very rigidly supported bearings eliminate vibrations with a remarkable degree of success.

An aluminum cone with a leather facing is used for the clutch, but there are three springs instead of the more usual one. Spaced equally around the clutch cone these light springs are ideally accessible for adjustment and there is no need for the exercise of any very special precaution to see that all are at the same tension, since inequalities are compensated for by a floating spider inside the flywheel. Cushion springs beneath the leather are used to ease the engagement, which is very smooth and soft. A special point is made of the light pedal pressure required, which is available for drivers of any stature by virtue of the adjustable pedal plates.

Characteristic Overland Axle Used

Though the after part of the chassis is similar in appearance to the well known Overland four, the rear axle is strengthened in proportion to the heavier stresses it has to bear. It is a floating type with

the road wheels mounted upon double rows of Timken bearings. For the differential, the four pinion bevel pattern is used, and there are large Timken bearings to support it and the crown wheel. The driving shafts can be withdrawn through the hubs, and the axle case is strengthened by the use of truss rods.

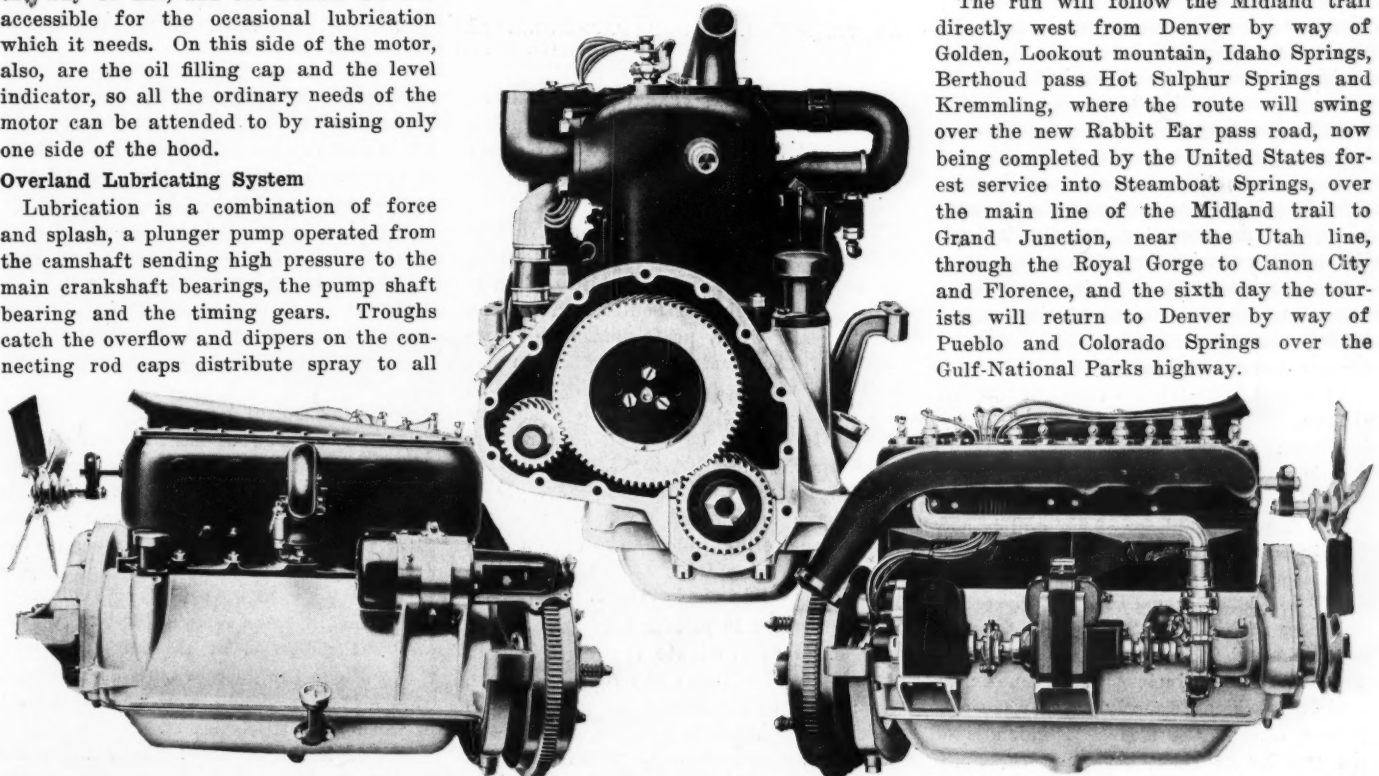
Located on the rear axle is the ball bearings, three-speed gearset and there is a torque tube containing the propeller shaft, in accordance with Overland practice. The single universal is located well forward in the chassis where it is completely protected and easy of access for lubricating purposes.

Quite a feature of the car are the large sized brakes, which provide great arresting power with smoothness of action, the service brake, in particular, having a wonderful grip with quite light pedal pressure. Ample width of drum and plenty of surface for both the external and the expanding bands are the secret, combined with direct pull rods and no lost motion or heavy pull-off springs.

SCHEDULE COLORADO TOUR

Denver, Colo., Aug. 6—An 850-mile reliability and economy run of 6 days through the Colorado Rockies is scheduled to start from Denver September 6. The event is being promoted by Charles F. Roehrig, secretary-treasurer of the Denver Motor Club, and publisher of a new Rocky Mountain travel magazine. Mr. Roehrig has just secured official sanction from the American Automobile Association, and will have the hearty support of Ralph W. Smith, vice-president of the A. A. A.

The run will follow the Midland trail directly west from Denver by way of Golden, Lookout mountain, Idaho Springs, Berthoud pass Hot Sulphur Springs and Kremmling, where the route will swing over the new Rabbit Ear pass road, now being completed by the United States forest service into Steamboat Springs, over the main line of the Midland trail to Grand Junction, near the Utah line, through the Royal Gorge to Canon City and Florence, and the sixth day the tourists will return to Denver by way of Pueblo and Colorado Springs over the Gulf-National Parks highway.



THREE VIEWS OF THE BLOCK MOTOR IN THE OVERLAND SIX. NOTICE THAT HELICAL TIMING GEARS NOW ARE USED FOR THE FRONT END DRIVE, ALSO THAT THE ACCESSORIES HAVE DIFFERENT POSITIONS

Detroit Electrics Show Reduction of \$600 and \$725

Production Will Be Doubled for 1916—Refinements in Chassis

FEATURES OF THE NEW DETROIT MODELS

*Six models with prices ranging
from \$1,975 to \$2,275*

*Four-passenger brougham \$1,975
instead of \$2,600*

Basic construction unaltered

*Steering handle vibration elimi-
nated*

Fuses of larger capacity

Redesigned current cut-out

*Braking system changed
slightly*

Controller drum refined

*Wheelbase on all models 100
inches*

WHAT might be regarded as a new epoch in electric car manufacture begins this week with the announcement of sweeping reductions in the prices of all of the models of Detroit electrics, made by the Anderson Electric Car Co., Detroit, the activities of which in its field are a good indication of the trend of this branch of the industry.

The Detroit models are to sell at prices ranging from \$1,975 to \$2,275, which means reductions running from \$600 to \$725, depending upon the model. Along with this significant move, Anderson makes the statement that production is to be practically doubled for the coming year, this being the main reason for the large reductions, as the cars are quite evidently not cheapened in any way. They are, as a matter of fact, more highly refined than the previous series.

As an indication of the standardization that is going on with the Anderson company, it has adopted a one-chassis basis of production, with five different types of bodies fitted thereto. This is a noteworthy situation from a manufacturing standpoint.

Models Are Six in Number

The 1916 Detroit models are comprised of six models. Briefly, these are model 61, which has been reduced from \$2,600 to \$1,975 and is a four-passenger brougham; model 60, a five-passenger double-drive brougham which formerly sold for \$3,000 and is now \$2,275; a rear-drive five-passenger brougham, model 59, which has been cut from \$2,950 to \$2,225; model 58, formerly \$2,950 and now listing at \$2,250, also a five-passenger brougham, but having front drive; a four-passenger inclosed type known as model 57, which formerly cost \$2,850 and is now \$2,175; and model 56 which is of the popular cabriolet style for three-passengers and sells at \$2,075 as compared with its old price of \$2,650.



ABOVE, MODEL 61 FOUR-PASSENGER REAR-DRIVE DETROIT BROUGHAM; BELOW THE DUAL-DRIVE BROUGHAM

There is nothing changed in the basic construction of these cars, they continuing to use a 4 horsepower series-wound motor with shaft drive to the rear axle, and 42-cell lead battery equipment.

There are, however, a number of refinements worthy of notice, all tending towards greater interchangeability of parts throughout the line of bodies, and to even better body work, performance and convenience. For instance, the glass in the bodies is mounted on thick rubber, with the channel dovetailed in such a manner that it is said to be impossible for wash water or the most driving kind of a rain to find its way within the body. Door locks have been fitted which may be operated from either side of the car on both the inside and outside of the doors, this having an obvious advantage.

How Vibration is Eliminated

In order to eliminate the vibrations in the steering handle of the rear-drive cars, due largely to the long steering reach rods which have hitherto been used, an idler bracket has been adopted. This is mounted on ball bearings in a dust and water-tight casing, and is bolted to the frame in the

same place as the steering mast of the forward-drive cars. The long reach rod has therefore been dispensed with in favor of two shorter rods, with the idler absorbing the shocks caused by the inertia of the rods and also road inequalities. The idler is nicely supported on springs which take up the wear and prevent rattles and vibration. It is packed in grease and so constructed that the whole inside mounting can be withdrawn readily from under the car.

Current Cut-Out of New Design

The current cut-out has been entirely redesigned in order to adopt the more efficient knife blade type of switch, as this new design has proven itself most reliable after much testing. The top cover of the cutout box is removable easily for inspection purposes, and as another indication of accessibility the removal of two screws, allows the bottom of the box, to which the contacts are fastened, to be removed. This makes it a simple matter to inspect or work upon the contacts.

Although the terminal board under the left rear seat is to be continued exactly as it was, the fuses for the lamps have been

increased from 4 to 5 amperes capacity. This makes them less liable to burn out, although the safety factor still is preserved. These fuses are made by the Johns-Manville Co., hence they are obtainable in most cities.

The third speed shunt has also been made of greater capacity, by using a larger diameter of wire. This acts principally to increase the rate of travel on third speed. It really makes a better speed range, for with the new wiring, the third speed is exactly half the difference between the second and fourth speeds, measured in miles per hour.

All the bearings in the controller have been made of the self-lubricating type. Another controller change is the redesigning of the cover and the use of a pressing for that member. The resistance for the adjustment of the motor brake, together with the meter shunt, has been mounted on the controller base and underneath the meter.

Drum Automatically Lubricated

A piece of felt, running the length of the controller frame and saturated with oil, provides automatic lubrication of the controller drum so that the drum contacts wipe across the felt which keeps the controller blade constantly clean and lubricated. Leakage of current is prevented through the oiled felt by now mounting the lubricator in a separate casing insulated from the controller base.

No change in principle has been made in the motor brake. Refinement details, however, include the use of a Raybestos covered disk, mounted upon a screw thread, which allows for adjustment for wear. This does away with the twelve or fourteen adjusting washers which were used on the previous models of motor brakes.

Improvements have also been made by the addition of more brake material, which allows for a greater wear without the need of frequent adjustment.

Brakes on rear hubs are of the internal expanding type, size $2\frac{1}{2}$ by 16 inches, and are operated merely by pushing the foot brake pedal forward. To the left of the foot brake pedal is located a smaller pedal.

INTERIOR OF
MODEL 59
REAR DRIVE
DETROIT
BROUGHAM



Pushing this small pedal forward with the foot applies the rear hub brakes and simultaneously cuts off the power through a knife blade cut out switch. It also operates a ratchet which sets the brakes. When the brakes are set in this manner they cannot again be released until the controller handle is in neutral position. This small lever is the one used in emergency when it is desired to stop the car very suddenly or when desiring to lock the brakes upon leaving the car.

A new design has been worked out for the first speed resistance. The resistance coil of heavy wire is supported on the frame at each end so that there is a circulation of air all around it. This increases the heat radiation, and affords a considerable saving in weight.

Other Refinements Made

Refinements have also been built into the controller mast and its universal, the latter now being of heavier construction than it was, with an adjustment provided for wear. A bar of spring steel is used to connect the joints so that there will be a slight yielding in case of an inexperienced driver applying the motor brake too harshly. The steel, however, is stiff enough to be rigid under all ordinary driving conditions. This construction is to safeguard the bending or disarrangement of any of the other parts of the controller mechanism.

Optional equipment is given for the rear

axle, for beside the standard type of worm drive used in the 1915 models, there is being offered a floating spiral-bevel rear axle. The reduction in the new axle is 6 to 1.

Battery Equipment is Large

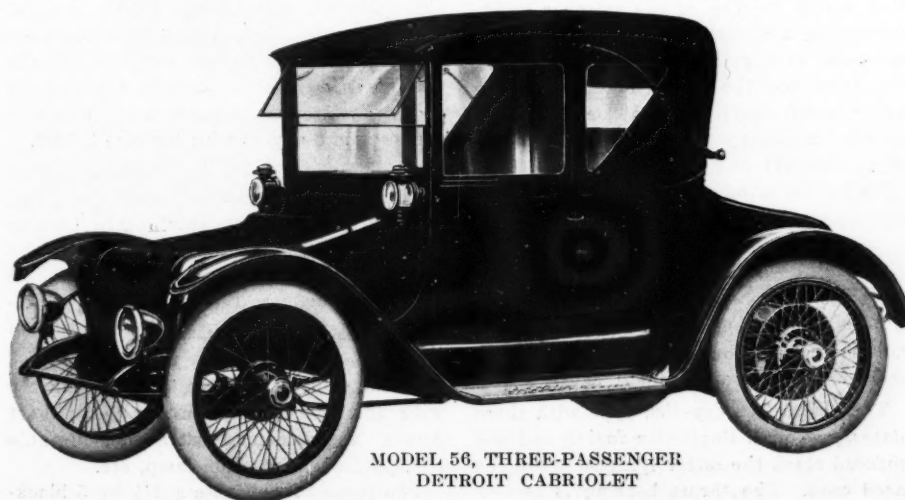
Battery equipment consists of forty-two lead-plate cells of fifteen plates each, and contained in eight trays. Weight reduction of about 50 pounds has been accomplished in the battery construction, this going hand in hand with a somewhat increased mileage capacity per charge.

Enumerating some of the special features of the several body types, the Anderson company calls special attention to the fact that model 61 is especially applicable to city driving due to its compactness and ease of handling in traffic. The operating levers are mounted on the left of the rear seat, and steering is accomplished by the driver's right hand, while the shorter lever does the controlling. Theft of the car is prevented by a nice feature whereby the levers may be swung upward into a vertical position and locked against operation.

Three persons can be accommodated on the wide rear seat, and a fourth passenger is taken care of by a revolving Pullman-type chair in the front right corner. Wire wheels or wood are optional, as are also Goodrich silvertown cord tires 34 by $4\frac{1}{2}$ or Motz cushion tires. Among the equipment features are a Weston voltmeter and ammeter, toilet case, cut-glass flower vase, and the Hanlon rain-vision windshield which has been used on Detroit's for some time.

The other models offer corresponding appointments and equipments, and all preserve the exemplary body work characteristic of the Anderson body factory. Aluminum is very extensively used with all portions of the bodies which are exposed to the weather such as hoods, window frames, roof, side panels, etc., efficiently constructed of this material. The fenders are also of aluminum and formed into an appropriate design, and are skirted to the bodies so as to completely protect them from splashing mud.

The standard wheelbase of all models is 100 inches.

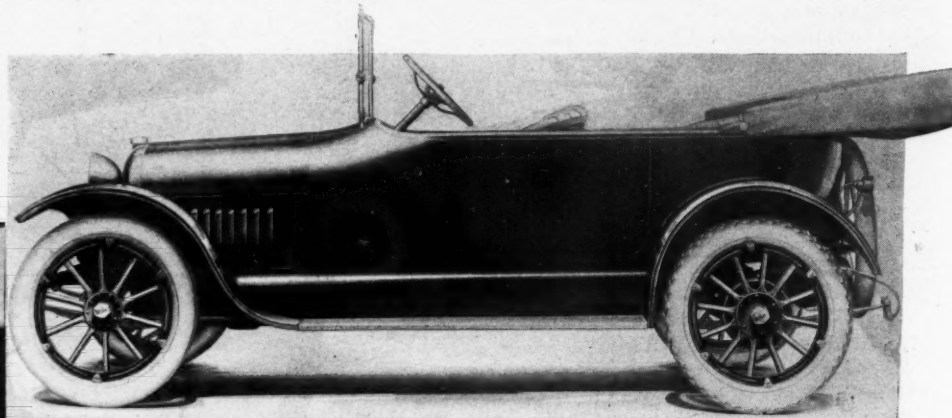
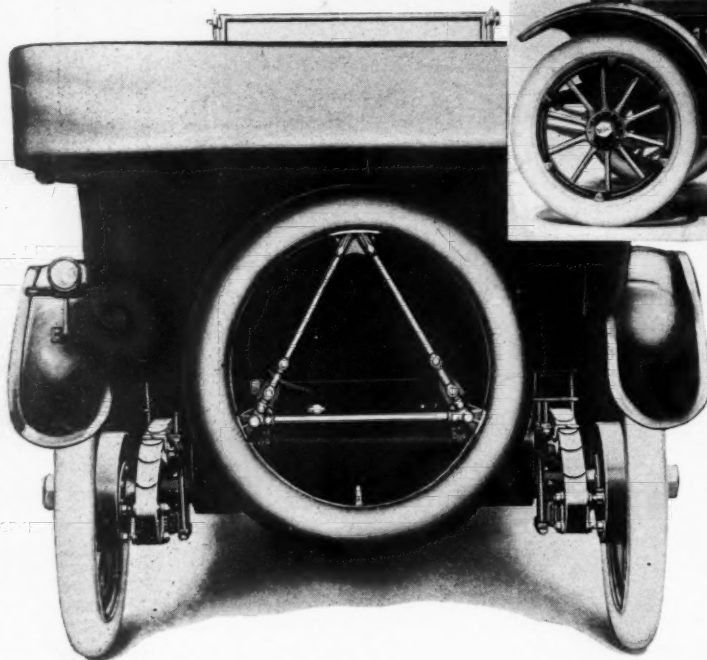


MODEL 56, THREE-PASSENGER
DETROIT CABRIOLET

Velie Offers \$1,065 Light Six and Large Improved Six

New Cars Show Few Differences in Design—Fours Discontinued

TWO sixes, model 22, a new design, five-passenger, at \$1,065, and continuations of the Biltwell five and six-passenger, are to be made by the Velie Motor Vehicle Co., Moline, Ill., for 1916 production. All fours have been discontinued



THE 1916
VELIE

Left, rear view showing odd tire carrier, also fitting of springs into frame channels. Top, the \$1,065 Velie, showing the neat streamline body

and the price of the improved car now is \$1,400 for the five and \$1,450 for the seven-passenger, instead of \$1,595 and \$1,645, respectively. The model 22 roadster sells for \$1,045.

The continued model has received no chassis changes of importance and slight alterations have been made in the body for the extra seats, which now fold into the back of the front seat.

New Car Like Model 15

Velie model 22 is an entirely new car and while its exterior appearance, as a whole, is only a shade different from the larger six, it is 9 inches smaller in wheelbase, being 115, has smaller tires, smaller motor and the other chassis units are proportioned accordingly. In general, the new car has a new type of Continental motor, $3\frac{1}{4}$ by $4\frac{1}{2}$, which was described in detail in the July 1 issue of Motor Age, a dry-plate clutch and three-speed gearset in unit and three-quarters floating axle. Hotchkiss drive is employed as in the large six. Tires are 32 by 4 and the equipment includes a Remy cranking and lighting system, instead of a Gray & Davis, as is used on the model 15.

The motor is a block-cast type, with a removable head and upper half of crankcase cast with the cylinders. The lower half is a pressed-steel oil pan. The carbureter, a Stromberg, is on the left and feeds through cored passages to the valves

FEATURES OF THE 1916 VELIE LINE

*Two sixes, one a new one
Seven-passenger model 15 reduced \$195*

*Model 22 like the 15 exteriorally
Chassis units are smaller
Parts are standard throughout
Remy electrical equipment on new six*

Hotchkiss drive on both cars

on the right. A hot air supply to the main air inlet is obtained by connection with the exhaust manifold through a pipe running across the top of the cylinder block. On the right there is a Remy combination generator and ignition unit, including coil, the drive for the whole being from the water pump shaft. The automatic spark advance is employed. The cranking motor is on the left and is of the flywheel-engaging type, using a Bendix gear.

Standard Motor Construction Used

Standard Continental practice prevails in the design of the interior motor parts, the crankshaft being a three-bearing type, all bearings being $2\frac{1}{2}$ inches long, the camshaft also a three-bearing and the rods and pistons of conventional construction.

The clutch is a dry-disk type with three plates, two with Raybestos facing and one unfaced steel, the latter lying between the faced ones. The thrust bearing is of the

ball type oiled by lubricant in the gearset housing.

The clutch adjustment is one of the Velie features which will appeal to the owner who takes care of his own car. There is but one adjustment and that can be made in a few minutes after lifting the front floorboards and clutch cover. With this done, there are two cap screws, which, when loosened, allow of the toggle carrier being turned sufficiently to take up play between the plates. The clutch operating pedal is adjustable for length and the foot pad may be turned in any direction, so as to make for even more comfort to the driver.

In unit with the clutch is the three-speed gearset, which afford the following ratios, with a $4\frac{1}{4}$ to 1 rear axle: First, 13.15 to 1; second, 7.96 to 1, and third, $4\frac{1}{4}$ to 1. This gearset uses a cast-iron housing and the countershaft bearings, which are bronze bushings, are oiled by drillings in shaft, while the main shaft uses ball bearings oiled directly by the lubricant in the case. The control for this gearset is of the ball type.

Hotchkiss Drive Employed

In the power transmission system there is a shaft with two universals, the torque and drive being taken through the rear, three-quarter, underslung, elliptic springs. The top ends of the springs are fastened under the frame channel and between the springs is a 15-gallon gasoline tank, which feeds to a Stewart vacuum tank. The fuel tank support also carries the tire holder.

The Velie body on this model is a neat streamline design showing boat lines, and all the little details which have become so familiar in the development of the streamline idea. There is a long slope from windshield to the rounded top radiator, which is similar to that employed on the large six.

In the equipment there is a one-man top with quick-acting curtains, propeller-shaft driven speedometer, extra demountable rim, portable inspection lamp, etc.

The large Bitwell uses a $3\frac{1}{2}$ by 5 block-

cast Continental motor fitted with a Stromberg carbureter and Atwater Kent ignition with automatic advance. The clutch and gearset are of the same design as in the smaller model, although the gearset is a four-speed and the transmission system shows a little variation. The equipment with this model includes a motor-driven tire pump.

FOSTORIA CAR READY FOR DELIVERY

Fostoria, O., Aug. 9—A two-passenger roadster at \$535 and a delivery wagon on the same chassis at \$500 are ready for delivery by the Fostoria Light Car Co., Fostoria, O., according to information, from the newly-incorporated company.

The passenger car is of light construction throughout and uses a four-cylinder motor with cone clutch and three-speed gearset in unit. The wheelbase is 100 inches and the tires 30 by 3. The rear axle is a semi-floating. The equipment at the price mentioned includes storage battery, electric lights, top, electric horn, windshield, etc.

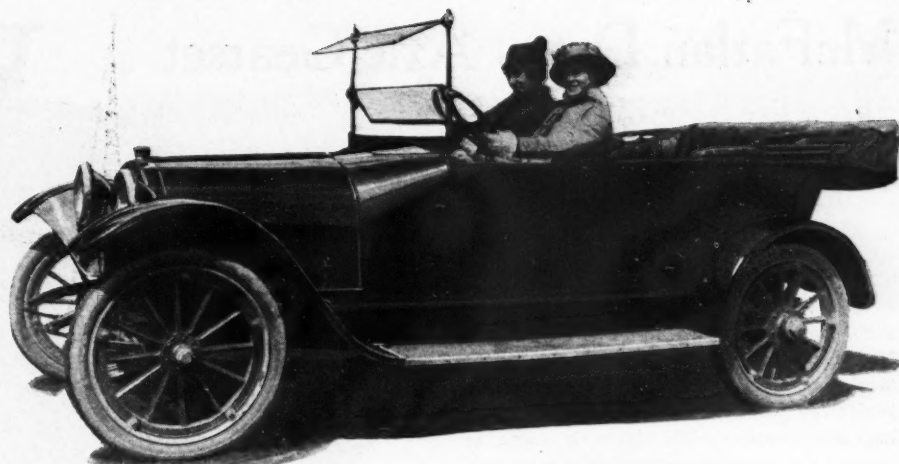
The Fostoria company has recently incorporated for \$100,000 and expects to build a touring car and coupe also.

KLINE ACQUIRES PROPERTY

Richmond, Va., Aug. 9—The Kline Car Corp. has acquired the property of the old Kline Motor Car Corp. for \$15,000. The property is situated just outside the city limits and covers a large area. All buildings, machinery, franchise rights and the right to use the name Kline are included in the property transferred.

WILL MAKE BULLET-PROOF TIRES

South Bend, Ind., Aug. 9—The Zeglen Tire and Fabric Co. has been organized at South Bend, Ind., to manufacture tires from the Zeglen bullet-proof fabric invented several years ago by Casimir Zeglen. This material first came into prominence when Zeglen perfected a bullet-proof coat and it is said that Archduke Ferdinand, whose assassination started the European war, wore a vest of this material and the assassin practiced for many weeks in an



Above, the Moore 30, which is being made in quantity. Its price is \$660. At the right is the Fostoria roadster, which is listed at \$535



effort to shoot him in the head. The new concern believes this material will make for complete elimination of tire troubles.

KNOX RESIGNS FROM LYONS ATLAS

Indianapolis, Ind., Aug. 7—H. A. Knox has resigned from the Lyons Atlas Co., where he has been manager of the motor car department for the last 2 years. He has made no announcement of his plans for the future, but temporarily he will return to Springfield, Mass.

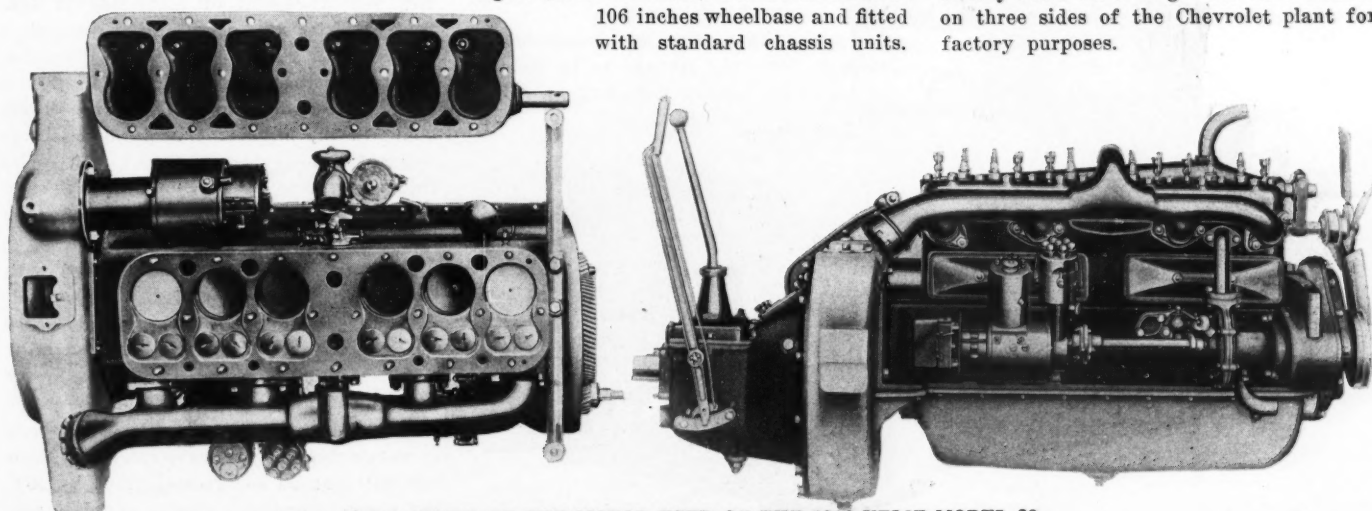
MOORE MAKES 1916 ANNOUNCEMENT

Minneapolis, Minn., Aug. 10—The Moore Motor Co., Inc., has announced its ability to market in quantity its 1916 model 30, which is a five-passenger touring car listing at \$660. The Moore is a standard car of 106 inches wheelbase and fitted with standard chassis units.

The motor is a four-cylinder, $3\frac{1}{4}$ by $4\frac{1}{2}$, thermo-syphon cooled, using Atwater Kent ignition, Stewart vacuum fuel feed and an electric cranking and lighting system. The body is a neat streamline, as shown herewith. There also is to be marketed a roadster at the same price and with the same equipment.

TAKES OVER MASON STOCK

Flint, Mich., Aug. 6—Complete linking of the Mason Motor Co. with the Chevrolet Motor Co., Flint, Mich., has been accomplished by the taking over of the remainder of the Mason stock by the Chevrolet company. At the same time that the stock transfer was completed ground was broken for an addition to the Mason factories and twenty more acres of ground were secured on three sides of the Chevrolet plant for factory purposes.



TWO VIEWS OF THE MOTOR USED ON THE 1916 VELIE MODEL 22

The left illustration shows the motor with cylinder head removed, giving access to the valves and pistons. Also notice the hot air connection to the exhaust manifold. At the right is a side view showing the Remy combination generator and ignition apparatus

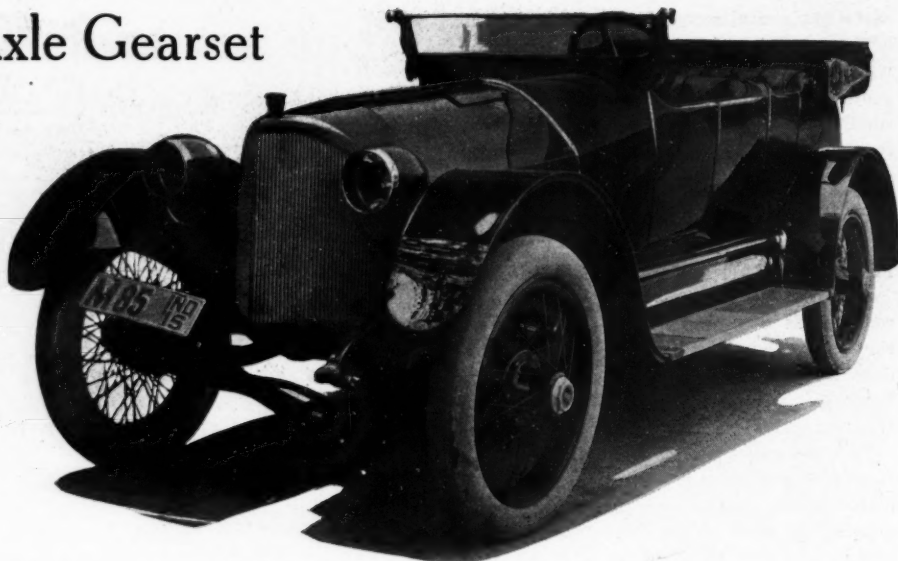
McFarlan Drops Axle Gearset

Distinctive Type of Cantilever Suspension—Other Improvements for 1916 Season

A REPRESENTATIVE example of the application of good engineering skill in increasing the riding qualities, appearance, balance and speed of a car, is the McFarlan for 1916, just announced by the McFarlan Motor Car Co., Connorsville, Ind. While the policy of the concern of marketing one chassis with either a large or smaller six-cylinder motor installed is continued, there have been some material changes of unusual interest and of such a nature as to cause the unfamiliar motorist to pronounce the 1916 model as entirely new. Because of the very nature of the alterations, a price increase has been made necessary and now the large McFarlan, which is equipped with a 4½ by 6 motor, is listed at \$2,990 instead of \$2,900, and the smaller model, the same in every respect with the exception of the motor size, which is 4 by 6, is listed at \$2,680, an increase of \$90 over the former model.

New Spring Suspension Interesting

While the motor is more powerful because of changes in the interior, and while there have been changes made in the drive and body, all will agree that of utmost importance is the new form of rear spring suspension which almost approaches in design that used by the English Rollys-Royce. In the McFarlan, cantilever springs are used, but instead of these being arched, as one ordinarily sees, they are perfectly flat and further are shackled at both ends. They take no drive and torque stresses and hence the double shackling is permissible. In the Rollys-Royce the flat spring is used but the rear portion is under the axle and operates between rollers, while in the McFarlan con-



ONE OF MCFARLAN'S SPECIAL BODY DESIGNS

FEATURES OF THE 1916 MCFARLAN

One chassis with either 4 by 6 or 4½ by 6 motor

Flat, Rollys-Royce type of cantilever springs

Springs shackled at both ends

Aluminum alloy pistons; lighter rods

Main bearings now fed under pressure

Gearset now amidships on sub-frame

Motor accessories in different locations

Pressed-teel cone for clutch

Special body types still featured

Price increased \$90

ception of goodness in design, the spring is fastened on top of the axle housing and uses a shackle for play instead of the rollers.

This form of suspension allows the springs to be flat under normal load and an excep-

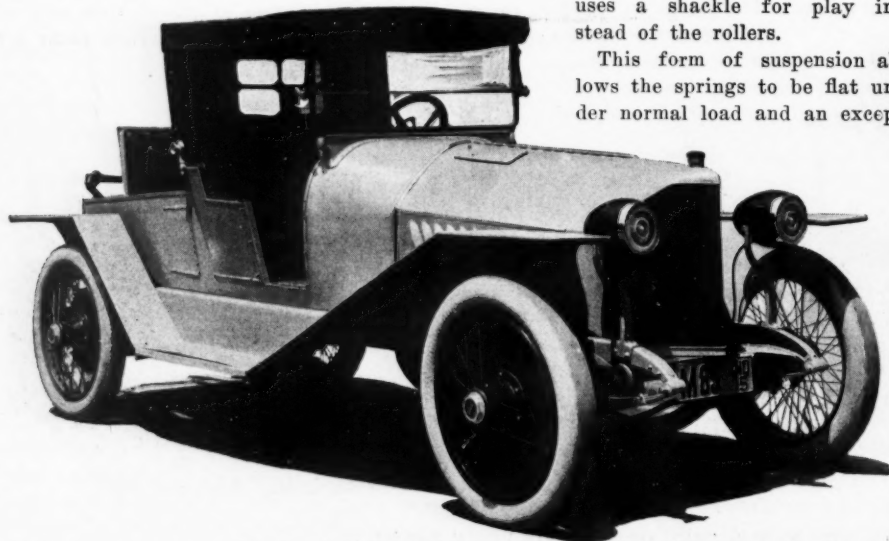
tionally easy riding car is obtained because of the comparatively slow return after the wheels have encountered an obstruction. Furtherance of the easy riding is also obtained by making the springs long and wide, the dimensions being 58 inches and 3 inches. There are fourteen leaves.

As in all cases where a cantilever supplants a three-quarter elliptic, frame strengthening is necessary and in the McFarlan a reinforcement has been placed along the line extending from the front shackle to the oscillating point. The pin upon which the spring is fulcrumed is of 1¼-inch diameter and extends across the frame.

Better Balance Obtained

With the new spring suspension there has been a better allround balance obtained by removing the gearset from the rear axle and placing it amidships upon a sub-frame and at the same time bringing the motor down to rest upon this sub-frame instead of in the regular frame channels. A general stiffening of the whole assembly has been brought about by this rearrangement of units and in conjunction with the new cantilevers give a car which is extremely free from air riding, that is the wheels stick to the ground even on rough going. There was little doubt in the mind of the Motor Age representative who rode in the car that its riding qualities have been improved two fold over the previous model with the three-quarter suspension.

The motor still is a T-head design with block cast cylinders, but its speed capabilities have been increased to some degree because of the fitting of aluminum alloy pistons instead of cast iron and lighter rods, although the latter have the same section. Just what maximum speed now is obtainable is yet an uncertainty, but one will not be far from correct by saying a good one-third greater speed is possible.



CUBIST ROADSTER, A MCFARLAN CREATION

Now that the r.p.m. is greater than before it has been thought advisable to install a plunger pump, driven from the exhaust camshaft, this pump forcing oil directly to the four main bearings. The pistons and cylinders are lubricated by constant-level splash as before. The carbureter still is a Stromberg and the feed as before by a short manifold to the valves. These are 2 inches in the clear and have cast-iron heads.

While the cranking, lighting and ignition system remains of Westinghouse make, there have been changes in location, the cranking motor now being on the right side instead of the left and turning the engine over by means of a toothed flywheel instead of through a train of gears connecting with the crankshaft at the forward end. It also is lower than in the 1915 model.

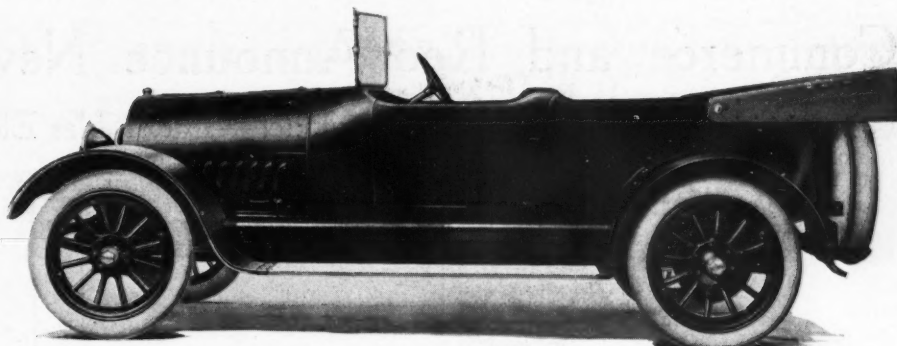
Change in Pump Position

The combination generator and ignition apparatus is on the left as before but it is lower so as to offer less restriction in making valve tappet adjustments and stands slightly farther away from the motor. The latter change has been necessary because the water pump, formerly an integral part of the crankcase, now is a separate unit driven directly from the timing gears. Pump capacity is 10 per cent greater than in 1915.

The separation of the pump as a portion of the case has been done to make replacement easy in the remote event this is necessary. The water pump shaft continues to drive a two-cylinder O.B. air pump.

In the cone clutch there has been but one alteration, a change from a pressed-steel cone to one of cast-aluminum. This clutch is a leather-faced type of 14 inches diameter and 4 inches face with twelve flat springs under the leather. Now that there has been a weight reduction in the cone there is a lower turning momentum and hence less chance for spinning with its consequent harsh gear changing.

The gearset, which as previously stated, is amidships on a sub-frame, is a Brown-



McFARLAN DOUBLE-COWL TOURING CAR, WHICH LISTS AT \$2,680

Lipe using ball bearings instead of rollers and a squared shaft of 1½-inch diameter, making it heavier than before. It uses a four-point mounting and drives an enclosed propeller shaft, the tube having a wide-yoked end as before. This tube, braced by rods running to the axle housing, takes both drive and torque.

There is only one other mechanical change of importance and that is the front axle knuckles are casted slightly as against being straight as used in 1915. This has helped to make the front wheels stick to the ground more easily.

The wheelbase still is 132 inches, but the tires fitted now are Silvertown cords, 36 by 4½.

Special Bodies Featured

A visit to the McFarlan factory is convincing evidence that the concern makes a detailed study of body design. A large portion of the factory is devoted to the building of all types, including special creations which many buyers conceive, together with those which the company uses as stock equipment.

The standard body for 1916 is a seven-passenger design showing detail improvement over the previous design, this being especially true of the front portion. While the body still is a double-cowl design, it is hung lower than before and has a better rounding out of the cowl and hood. This has been helped by widening the cowl, and by raising it the leg room in front has been increased. The rounded front has called for a new design of radiator and

windshield both of which harmonize better with the rest of the design. The upholstery has a wider piping but is of the same material as before.

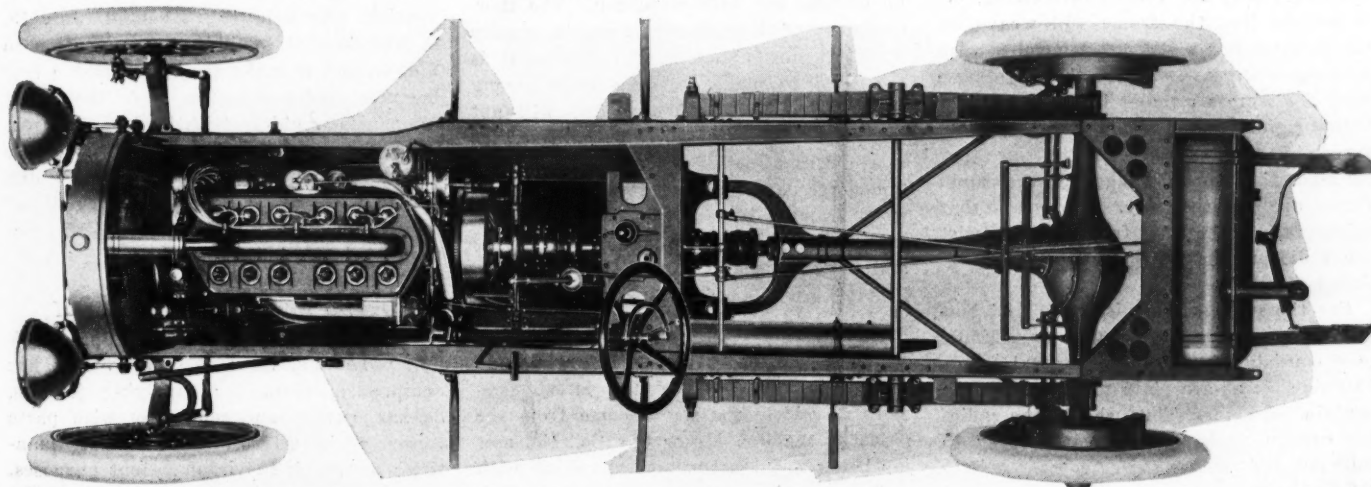
PARKING SYSTEM FOR ELECTRICS

Chicago, Aug. 9—A long desired service for the users of electric vehicles in Chicago recently has been put into effect through the efforts of the Electric Vehicle Association of America. It is a system of parking waiting electrics in the shopping district of Chicago. As many cities have laws denying the privilege of cars standing for any length of time at the curb in city streets, this is sometimes a considerable hardship if one has no chauffeur.

That an electric obviates the necessity of employing a chauffeur is considered one of its greatest advantages. However, women who run their own electrics for some time have realized how difficult it is to use their cars for shopping purposes in the loop.

Appreciating this difficulty, several garages have established under the auspices of the Electric Vehicle Association, a downtown parking service for their customers, enabling them to leave their cars at the Electric Shop of the Commonwealth Edison Co., where a licensed chauffeur drives it to the park and returns it again whenever ordered. There is no charge for this service.

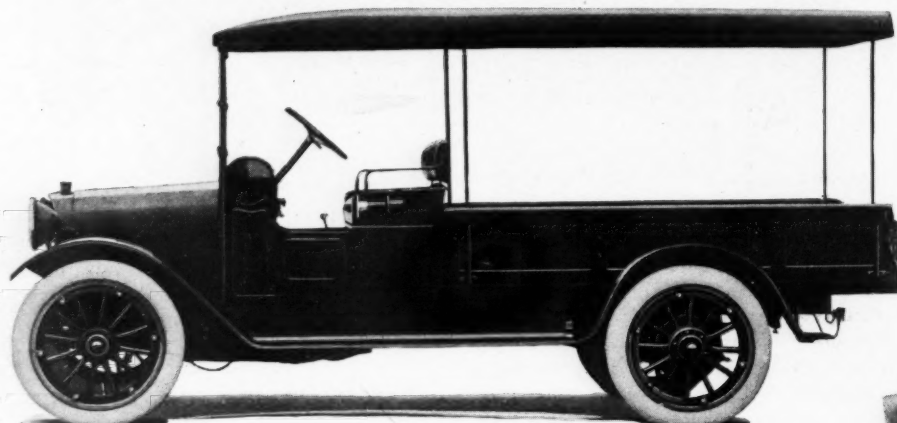
All electric garages represented in the Chicago section of the Electric Vehicle Association are participants in this plan.



McFARLAN CHASSIS FOR 1916 SHOWING THE CHANGE FROM REAR-AXLE TYPE TO AMIDSHIPS GEARSET, ALSO NEW CANTILEVER REAR SPRINGS SUSPENSION

Commerce and Reo Announce New Commercial Cars

Both are 3-4-Ton Models—Latter Has Electric Cranker



THE NEW REO TRUCK

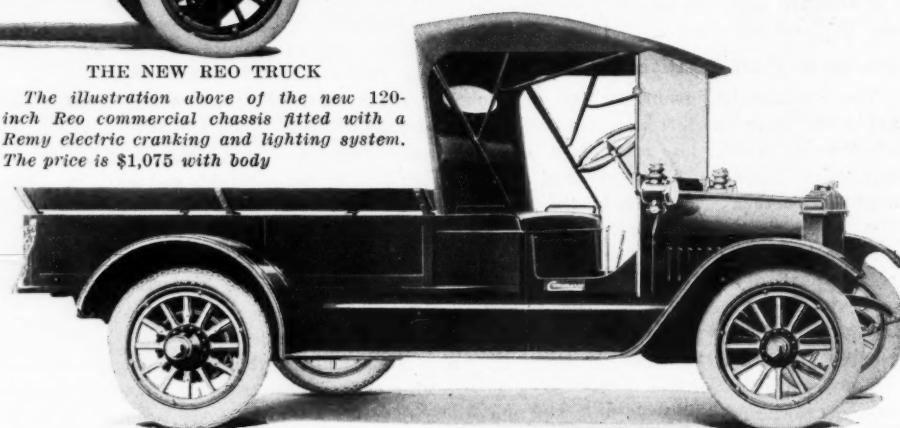
The illustration above of the new 120-inch Reo commercial chassis fitted with a Remy electric cranking and lighting system. The price is \$1,075 with body

THE Commerce Motor Car Co., Detroit, Mich., has announced a new model 1,500-pound delivery wagon at \$975, with either an express or panel body, and with chassis units of standard make. The motor is a 3 by 5, thermo-syphon cooled, four-cylinder Continental, the cone clutch and three-speed gearset are from the Detroit Gear and Machine Co., and the rear axle a three-quarters floating of standard construction. The wheelbase is 107 inches and tires are pneumatic 34 by 4, with non-skids in the rear.

There is no need to say much about the motor save that it embodies all the best Continental practice. The four cylinders are in block and the valves are individually accessible through brass valve caps. On the right side the Eisemann magnet is situated and is low enough not to obscure the valve springs, which are inclosed behind pressed-steel cover plates. On the left side there is nothing but the Breeze carbureter and the oil filler with its gauge.

Three-point suspension is used for the power plant, the front end resting on a dropped cross member of the frame. This cross member does not carry the radiator and the reason for this is interesting. It is certain that the frame will weave, so the radiator has a stiff cross member with nothing to do save support the water carrier. This cross member is not riveted or bolted rigidly to the frame sides, but is secured by two cap screws that are put through the upper flange of the main frame, one on either side. Any weave that takes place in the main frame cannot twist the radiator support, so the cooler is relieved of all stresses.

For the radiator cast iron top and bottom tanks are employed and the middle part consists of a nest of vertical tubes. The side pieces are plain pressed-steel and contain no water. Thus, should the radiator happen to be damaged it is easy to take out and replace the core without having to buy a complete new radiator. Coming to the axles the rear is a built-up con-



THE LATEST 1,500-POUND COMMERCE COMMERCIAL VEHICLE

This is built of standard chassis units and has a 107-inch wheelbase, Continental motor, cone clutch and three-speed gearset

struction with a stout cast steel center that carries the differential and bevel wheels; there are four differential pinions and large ball bearings to support the whole. As a type, the axle is three-quarter floating, with Hyatt heavy-duty bearings to carry the wheels. Brakes are 15 inches diameter and 2 inches wide, so there is plenty of surface.

There are three standard body styles, a panel, an express truck without canopy, and with a mohair top for the driver, and an express car with wood top. The thoroughness of the chassis work is equally apparent in the bodies. Of course, it is not hard to make an open body strong enough, but a panel body that will not rattle or bulge after a year's hard service is a different sort of proposition. For the Commerce panel body plenty of good hardwood framing is used, the doors are solid enough for a 3-ton truck and the hinges and bolts unusually stout.

REO HAS A NEW 3-4-TON TRUCK

Lansing, Mich., Aug. 9—One thousand dollars is the price of the latest commercial vehicle chassis to come from the plant of the Reo Motor Car Co., the new job being a ¾-ton commercial vehicle with a four-cylinder, 4½ by 4½ motor, disk clutch, three-speed gearset and shaft drive

to bevel-gear axle. The wheelbase is 120 inches. The price with express body and canopy top is \$1,075.

The motor shows characteristic Reo design, having the inlet valves in the head and the exhaust on the side. Oiling is by a combination splash and force feed and carburetion is taken care of by a Johnson instrument. Ignition is by a Remy unit mounted on a Remy generator, which is used for lighting. There also is a Remy cranking motor provided.

Equipment includes a ventilating wind-

shield, 100-ampere-hour storage battery, ammeter, horn, etc.

The body dimensions are inside length 96 inches; width, 44 inches; the over all height is 92 inches, and width, 66 inches.

DATE SET FOR E. V. A. MEETING

New York, Aug. 9—Cleveland will be the scene of the sixth annual convention of the Electric Vehicle Association, October 18 to 19, at the Hotel Statler.

The organization meeting of the convention was held in Cleveland, July 19. It was decided to limit the convention to 2 days, and to make the convention a real business undertaking so that the many companies would feel justified in dispatching a large number of delegates. While entertainment will not be entirely dispensed with, yet it will only be employed to supplement the more serious and practical work of the convention.

OPENS REPAIR PARTS SUPPLY

Cleveland, Ohio, Aug. 9—The Ford-Clark Co., Cleveland, an Ohio corporation, has equipped a plant for supplying jobbers, dealers, garage and repairmen with parts formerly difficult to obtain in small quantities for repair and replacement purposes. The line will consist in part of robe rails, springbolts, foot rails, windshields, etc.

Ford Ambulance for French Troops

Body Built by Chicago Concern

FRENCH troops have been presented with an ambulance by the Chicago LaFayette Society, an organization that is doing much for the soldiers of France. The body of the ambulance shown herewith was designed and built by the Auto Remodeling Co., Chicago, and fitted to a Ford chassis.

The ambulance, which has been sent to the French Red Cross Portable Hospital, No. 1, in charge of Mrs. Borden-Turner, sister of John Borden, of Chicago, is designed for four patients, with a stretcher for each one. Many unique and practical features mark this design. The body is made of wood and sheet metal so that the weight is reduced as much as possible.

The stretchers are held in place by small hooks and rest on rubber-tired rollers so that they can be rolled in and out freely on guide rails. An aisle 14 inches wide is provided in the center as a passageway.

An Ajax 6-120 battery, inclosed in a box that can be used as a seat for an extra patient or an attendant, furnishes current for a dome light. This light is controlled by two switches, one at the driver's seat and one on the dome itself.

The disadvantage of building an ambulance body to fit a Ford chassis; that is, the length required for stretcher back of the driver's seat, was overcome by raising and setting forward the steering post, raising the driver's seat and equipping the stretchers with folding handles, thereby allowing the rear doors to close 6 feet back of the driver's seat. Two extra leaves were added to the rear springs, and drop windows in the rear doors and in the partition back of the driver's seat furnish sufficient ventilation.

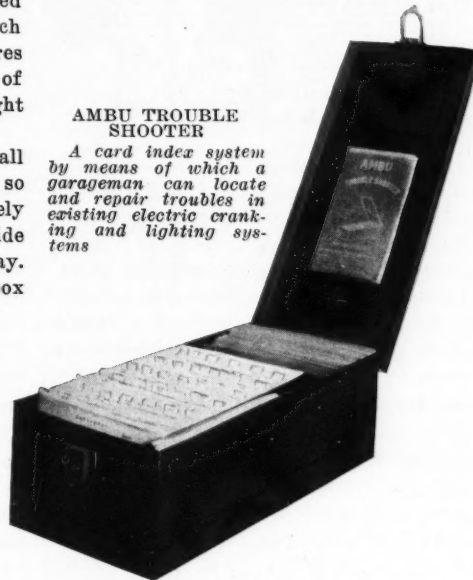
AMBU TROUBLE SHOOTER

Troubles in the electric cranking and lighting systems of the various cars on the market are the bugbear of the general

repair business and in order to acquaint the repairman doing a general business with the construction, repair and care of such systems, the American Bureau of Engineering, 1526 Wabash avenue, Chicago, has introduced what it calls the Ambu trouble shooter. This is a card system whereby the workman is able to locate trouble of any sort in a systematic way, thus eliminating time waste, and after locating the trouble instructions are given

AMBU TROUBLE SHOOTER

A card index system by means of which a garageman can locate and repair troubles in existing electric cranking and lighting systems



to enable the operator to correct it. By means of this outfit, the workman need only know the trouble and the system installed on the car and by correctly following the instructions, which are quite clearly laid out, he can, by a process of elimination, determine just what is causing the trouble.

Each cranking and lighting system is a unit in the Ambu. All trouble in a Dyneto system, for example, will be found in the cards under that name. There also is a blue print of the wiring of the system so

that the workman can trace every wire in the system and thus check his work. Both the prints and the cards are arranged alphabetically according to the name of the car using the system. Thus under Bijur, Apperson is first, followed by Hupmobile, Jeffery, Packard, Winton.

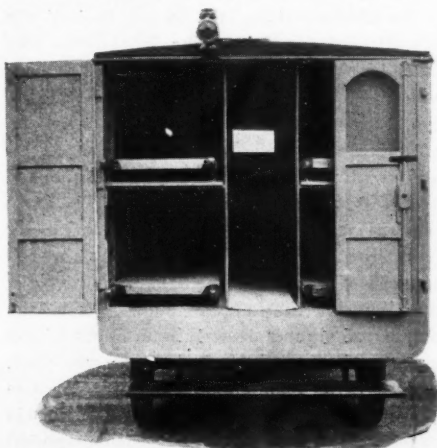
In order that the repairman derive some direct benefit from the use of the system, aside from merely locating the trouble and correcting it, there is provided a series of cards giving the construction and operation of the various parts of each system such as fuses, cut-out, regulator, etc. In this way the workman not only can make efficient repairs but can get a clear understanding of the reasons for making each and the action which is supposed to result.

The cards are contained in a substantial metal box as shown herewith. The price is \$50 which includes service for 1 year. This service is in the form of additional cards and corrections which may be necessary as the car maker adopts a different system or makes alterations in the present one. It also includes service by letter in the event the repairman has difficulty making any repair.

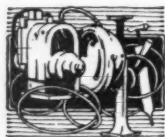
TO BOOST MISSOURI ROAD

Columbus, Mo., Aug. 7—"Rock the Old Trails in Missouri from end to end." Such was the pervading spirit at the annual convention of the Missouri Old Trails Association which was attended by 250 delegates here today. Every county through which the Old Trails road passes was represented.

Judge J. M. Lowe, of Kansas City, president of the National Old Trails Road Association declared that Missouri's link in the road should be all hard surfaced within the next year. The money now distributed to Missouri counties for road work, Judge Lowe said, if used under the supervision of a state highway commissioner would build 500 to 1,000 miles of hard-surfaced roads annually while now he pointed out comparatively few miles of good roads are built with this money.



TWO VIEWS OF THE AMBULANCE PRESENTED TO FRENCH SOLDIERS BY THE CHICAGO LAFAYETTE SOCIETY



The Accessory Corner



Kennedy Refreshment Case

WITH the touring season at its height, the motorist is interested in such fitments as luncheon outfits, and one of the most recent additions to this field is the Kennedy refreshment case, made by the Kennedy Mfg. Co., 14 East Jackson boulevard, Chicago. The Kennedy is an all-steel outfit listing at \$6.50 and containing a waterproof steel ice box, and another compartment for food which does not require direct contact with ice to prevent deterioration. The ice box, removed from the case, shown in Fig. 7, is fitted with a cover, which, when closed, prevents spilling or leaking. There is no rattle when the parts are all sealed. The case is 24

FIG. 1—TELOMETER COMPRESSION INDICATOR

by 13 by 7 inches and is finished in black enamel.

Telometer Compression Meter

A neat, simple instrument for recording the maximum pressure in each cylinder of a motor has been perfected by the Zighometer Mfg. Co., 1037 North Waller avenue, Chicago. This device is called the Telometer and it consists essentially of a brass tube within which is a spring-backed steel piston the rod of which is fitted with a drum upon which a card is mounted. Resting against this card is a piece of lead held in a guide. When the instrument is screwed into a spark plug hole and the motor is operating, the compression forces the piston upward and this carries the drum and card upward, thus causing the lead to mark on the card, the latter being calibrated in pounds per square inch from 0 to 100, the compression pressure is recorded.

The Telometer is shown in Fig. 1 and in Fig. 2 is a reproduction of one of the cards. When it is desired to find the compression pressure of any cylinder, the instrument is screwed into a spark plug hole and the motor allowed to operate until it gets warm. The exhaust can be allowed to pass out through the petcock at the bottom of the instrument. With this petcock closed the drum will be raised by the force

TELOMETER INDICATOR CARD

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ZIGHOMETER MFG. CO., CHICAGO ILL.

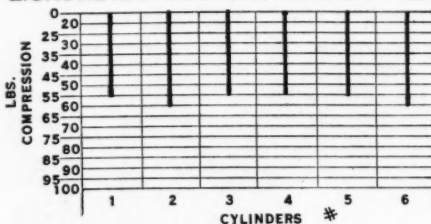


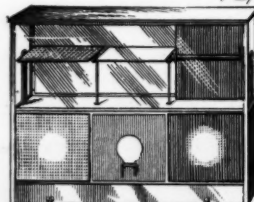
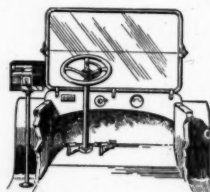
FIG. 2—HOW COMPRESSION IS RECORDED ON TELOMETER CARD

of the exhaust against the piston inside and the pencil mark will indicate the maximum pressure. This done for each cylinder one can tell if there is any variation in pressure and hence explosion effort.

In order to make the Telometer suitable for different-size plug openings a fitting is given for $\frac{1}{2}$ -inch plugs, the instrument bottom being $\frac{7}{8}$.

Ames Hood Machine

A small machine for cutting louvers in Ford hoods has been brought out by R. G. Ames & Co., 1339 Michigan avenue, Chicago. This machine is quite simple in construction and in less than 15 minutes cuts ventilators in a Ford hood, the operation requiring no more than the positioning of the hood and pulling of a handle on the machine. The price is \$35 and it is stated that those desiring to go into



TO THE LEFT—STRAIGHT AHEAD—TO THE RIGHT

FIG. 3—SHERMAN-CRANE TRAFFIC SIGNAL

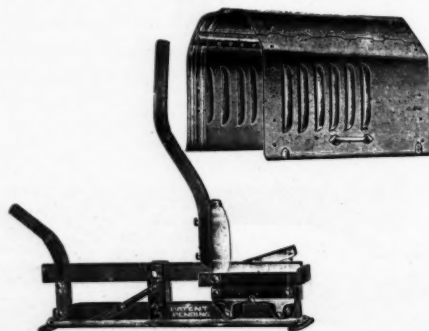


FIG. 4—AMES MACHINE FOR CUTTING LOUVRES IN FORD HOODS



FIG. 4—CORE SPEEDOMETER, WHICH ACTS AS THEFT PREVENTER

the business of making ventilating hoods out of non-ventilating, can charge \$1.50 to \$2 for the work. The Ames is shown in Fig. 3, together with a hood which has been made into a ventilating type.

Use-Bull Valve Tool

The Hughes Bull Co., 1038 West Hancock avenue, Detroit, Mich., has just announced a combination tool which grinds the valve face and seat in one operation and uses the valve itself as a partial means of keeping the cutting tool's centers directly above one another. As shown in Fig. 6, the tool is inserted through the valve opening and the valve is placed in its regular position so that the lower portion of the stem fits into its guide. The handle then is turned and the cutter on top removes metal from the valve face while the lower cutter takes care of the seat. In order to keep the valve in position against the cutter a spring is used, as shown in the illustration. With this tool it is possible to grind in a set of valves in considerably less time than by the use of compound.

Sherman-Crane Signal

An electric signaling device to indicate the direction a motor car intends to proceed at street intersections is being marketed by the Sherman-Crane Signal Co., Denver, Colo. It has a double-deck arrangement, with flag and lantern effect, and is attached on the left running board near the windshield as shown in Fig. 4 in such a manner that it can be seen easily from front and rear. Green, white and red squares of glass are thrown to an upright position in the upper portion for the respective signals desired, and lights of the same colors are flashed in the lower part, thus making the signal suitable for use in both daylight and darkness. It also is equipped for having the horn sounded whenever the button is pressed for any

signal. It is made of a metal frame, with glass sides, by a piece of three-quarter-inch iron pipe and flanges.

Green, the left or outside color, means a turn to the left; white, the middle color, means straight ahead; red, the color next to the machine, means a turn to the right; while a combination of either side color with the middle color means a turn around in the direction of the respective green or red of the combination; all three are flashed together for stopping and the red and green are shown together for reverse. The signals are clearly visible from any direction ordinarily required. Price is \$15.

Core Speedometer

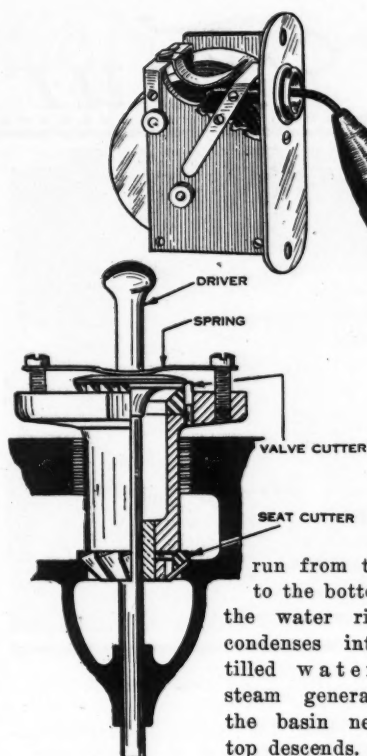
J. H. Core, 600 North Third avenue, Nashville, Tenn., has perfected a speedometer which acts as a speed recording instrument, car speed controller and car theft preventer. The instrument, which is shown in Fig. 4, has a circular speedometer dial and another small one, which when set at a certain speed on its own dial, prevents the car from being driven beyond that speed. When set at zero the ignition system is made inoperative and when turned to the maximum speed on the instrument the car may be driven to that speed. There also is a trip and total mileage odometer at the bottom of the instrument.

U. S. L. Steam Still

Garage, repair shop and battery service station managers often find it to their advantage to make their own distilled water for use in filling batteries, and in order to supply the demand for a suitable still, the United States Light & Heating Co., Niagara Falls, N. Y., is marketing the one shown in Fig. 5. A feature of this still is that it uses the heat generated within for preheating the incoming water to the

boiling point, so that impurities in the form of gases in the water are liberated immediately. Provision is made to prevent any of the raw water from being carried out with the steam, so that the distilled water is as free from impurities as is possible to get in a commercial still.

The feed water enters the inlet provided near the bottom of the still and surrounds the condenser tubes, which



serves to heat the raw waste rising in the condenser. In so doing, the raw water becomes heated to the boiling point, and when it reaches the top of the condenser the ammonia and other gases escape into the air through an opening provided. Most of this feed water flows through a goose-neck into a waste pipe, and the balance passes into a basin. The water in the basin is heated and distilled by live steam circulating at a pressure of 25 pounds or over, through the copper coil in the bottom of the basin. The distilled water comes out at the bottom of the still and can be piped away to any receptacle.

Universal Pliers

A pair of pliers which will handle not only regular-shaped pieces, but in addition, will take round, triangular and tapered objects, has just been announced

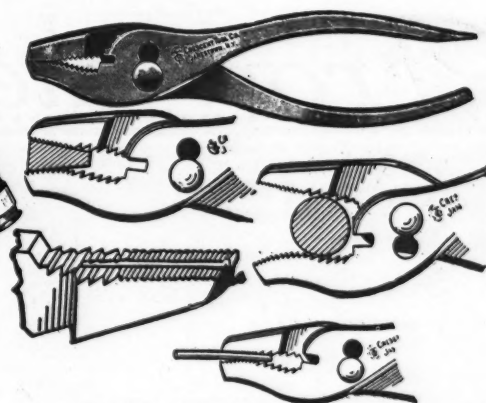


FIG. 6—TOP, LEFT, AUTOMATIC CIGAR LIGHTER; RIGHT, UNIVERSAL PLIERS; BOTTOM, LEFT, USE-BULL VALVE TOOL

by the Crescent Tool Co., Jamestown, N. Y., under the name of Universal, from the fact that the pliers may be used upon objects of any shape. The Universal handles a variety of pieces, because of the peculiar shape and construction of its jaws. The lower jaw is curved, as shown in Fig. 6, and deeply toothed, while the upper jaw is straight. It will be noticed that the teeth near the front of the jaws are finer than those at the rear and also that the upper jaw has a slot through the middle. The finish is nickel or black.

Automatic Cigar Lighter

The Electric Automatic Cigar Lighter Co., 556 West 27th street, New York, is offering a line of electric cigar lighters, and one of the prominent types in the line is that shown in Fig. 6. This is a flush-type instrument, with the cable wound upon a spool. When it is desired to use the lighter, it merely is pulled out from the casing, thus unwinding the cord. This action automatically turns on the current. When the passenger has finished lighting a cigar or cigarette and the cord is allowed to rewind on the spool, the current automatically is stopped. It operates from any battery and has the following dimensions. Width, 1 1/4 inches; height, 2 1/4 inches; depth, 2 inches.



FIG. 5—U. S. L. STILL FOR GARAGES



FIG. 7—KENNEDY REFRESHMENT CASE WITH ICE BOX

From the Four Winds



THE PROVERBIAL PARLANCE REVAMPED—HE'S TIED INSIDE

CAR for Every 15 Persons—Pomona, Cal., has one motor car to every 15 inhabitants, according to the deputy assessor, C. W. Talbott. There are 825 cars in the city, valued at \$500,000.

Dimmers for Pittsburgh—The public safety department of Pittsburgh, Pa., has made a ruling which prohibits the use of glaring headlights on motor cars in the downtown district.

Motors Bear 20 Per Cent of Tax—One-fifth of the assessed valuation of the personal property of Redlands, Cal., is represented by motor cars. It is estimated that there is a car to every third family in the city.

Jitney Drivers Form Union—Jitney bus drivers of Fort Wayne, Ind., have formed a union for their protection and have secured the endorsement of the federation of labor.

Protection for Michigan Garagemen—Michigan has adopted a new law designed for the protection of garage proprietors against those who refuse to pay for repair work. The measure gives the garagemen the privilege of invoking the lien law process of collection.

Requires Reserve Bus Equipment—The public service commission of Maryland now requires that owners of motor bus lines maintain a sufficient reserve equipment in good operating condition to insure the reasonable maintenance of the established routes and schedules.

To Test Jitney Ordinance—The legal test of the new ordinance governing the jitney bus in Baltimore, Md., has started. Those fighting it are doing so on the ground that the city tax of \$25 a seat per year is burdensome and as it stands at present the city has been restrained from putting the new law into operation.

Seek Amalgamation of Ford Owners—The American Ford Association, which has been formed with national headquarters at Albany, N. Y., expects to enroll in its membership Ford owners, users, admirers, dealers, agents and manufacturers of parts for the Ford. It is hoped to unite the 700,000 Ford users to the end that any benefits deemed reasonable may be gained.

Two Charged with Car Theft—On a charge that they are connected with a big motor car stealing gang, which has been operating in Cleveland, Toledo and Detroit, Joe Madden and a man known as Reek are being

held at Angola, Ind., pending an investigation. The gang is said to have stolen a number of Fords, repainted them and offered

Coming Motor Events

CONTESTS

August 6-7—Track meet, Allentown, Pa.
 August 7—Speedway invitation, Chicago.
 *August 13—Track meet, Flemington, N. J.
 August 14—Track meet, Johnstown, Pa.
 August 14—Dirt track races, Janesville, Wis.
 August 18—Track meet, Conneaut, Pa.
 *August 20-21—Elgin road races, Elgin, Ill.
 August 21—Track meet, Cumberland, Md.
 August 21—Track meet, Ellenville, N. Y.
 August 24—Track meet, Hagerstown, Md.
 *August 25-26—Hillclimb, Newport, Ind.
 *August 27-28—Track meet, Pittsburgh, Pa.
 *August 28—100-mile dirt track race, Kalamazoo, Mich.
 September 3—Track meet, Arden, Pa.
 September 4—Track meet, Youngstown, O.
 *September 4—Speedway races, Minneapolis, Minn.
 September 11—Track meet, Burlington, Ia.
 September 11—Track meet, Erie, Pa.
 September 14—Track meet, Punxsutawney, Pa.
 September 18—Track meet, Butler, Pa.
 *September 18—Speedway races, Providence, R. I.
 September 24-25—Track meet, Grand Rapids, Mich.
 October 1—Track meet, Trenton, N. J.
 *October 2—Speedway races, New York.
 *October 2—100-mile track races, Fresno, Cal.
 October 16—Speedway races, Chicago.
 November 15-20—El Paso-Phoenix road race.

* Sanctioned by A. A. A.

SHOWS AND CONVENTIONS

August 26-September 1—Ventura, Cal., show.
 August 30-September 4—Columbus, O., show.
 September 13-19—Pan-American road congress, Oakland, Cal.
 October 4-9—St. Louis show.
 October—Los Angeles show.
 October—Portland, Me., show.
 January 1-8—New York show.
 January 22-29—Chicago show.
 January 29-February 5—Minneapolis show.
 March 4-11—Boston show.

them for sale in northern Indiana, Ohio and southern Michigan at from \$25 to \$50 each.

Copper-Colored Tags for Arizona—Arizona motor cars next year will bear license tags of a copper color, signifying the state's supremacy in the production of this metal. The figures on the plates will be black.

May License Kansas Tractors—Tractors in the state of Kansas may be required to pay a license tax next year. The state registration department officials believe the tractors do greater damage to roads than motor cars, therefore they should be taxed.

Table as Car Equipment—Mrs. G. A. Rockwell, Junction City, Kan., is arranging for the manufacture of a table to be used in motor cars fastened to the robe rail. It can be adapted for use as a child's seat and admits of being folded out of the way when not wanted.

Pennsylvania Licenses Orange and Black—Motor car license tags in Pennsylvania for 1916 will have black figures on a field of orange. They will be made of a special quality of scraped and rolled steel and enameled by a special process whereby chipping will be avoided if the tag becomes bent.

Motors Reflect Prosperity—An unusual degree of prosperity is reflected in the report of the New Mexico motor vehicle department which shows 4,230 motor cars licensed this year, which is 60 per cent more than were issued for the corresponding period last year up to August 1.

State Employees Allowed Mileage—W. E. Davis, state auditor of Kansas, has notified officials and employees, who turn in expense accounts, that they will be allowed 6 cents a mile for the use of their private motor cars in making trips for the state. Some officials complain that 6 cents a mile is not enough, but the auditors contend that it is.

Paige Given Unique Test—A six-cylinder, seven-passenger Paige ran several blocks in New Haven, Conn., recently, without a pilot. The car was started, thrown into third speed, throttled down to about 2 miles per hour, after which the driver dismounted and walked along the sidewalk, leaving the car to its own devices.

Utility Trailer for Ford—The illustration shown on this page gives a graphic idea of how James H. Jones, South Hadley, Mass., a retired motor car engineer, uses a Ford roadster with a 1,500-pound capacity wagon as a trailer. The two are coupled together with a Martin rocking fifth wheel, which permits the wagon to be handled as easily as if a team were attached to it.

Kansas Registrations Increase—Fees received as the state's share of motor license taxes have increased in Kansas this year, \$48,959 being the state's share up to June 30 last, while it was only \$30,702 for the entire year ending December 31, 1914. The state receives 75 cents of each \$5 paid for motor car licenses, the balance going to the county from which the tax originates, to be used for road construction and improvement.

Gasoline Exports Increase—According to a report made by the department of commerce, exports of gasoline and naphtha for the first 6 months of this year were totaled 26,800,218 gallons, valued at \$3,101,403, compared with 17,382,036 gallons with a value of \$2,149,491 during the corresponding period of 1914. For the 12 months ending June 30, 1915, 240,018,306 gallons were exported, compared with 185,578,776 gallons during the year previous.



Among the Makers and Dealers



MILLER Tire Adds—The Miller Tire and Rubber Co., Cleveland, O., has taken out permits to build two factory additions, which will cost nearly \$300,000.

Toledo-Ford Tire Expands—Work has begun on a factory addition for the Toledo-Ford Tire Co., Findlay, O. The structure will be 50 by 100 feet.

Apperson Plant Addition—The Apperson Bros. Automobile Co., Kokomo, Ind., has begun work on an addition to one of its plants, which gives 150,000 square feet more of floor space.

Absorbs Canadian Motor Company—The Great West Motor Co., Winnipeg, Man., has been organized to take over the business of the Canadian Motor Co., which has gone into voluntary liquidation.

Clubhouse for Allen Motor—Directors of the Allen Motor Co., Fostoria, O., are planning to erect a clubhouse at Rockledge on the shore of Lake Erie, which will involve the expenditure of \$10,000.

Rim Plant Damaged by Fire—The plant of the Howard Demountable Rim Co., Trenton, N. J., was damaged seriously August 4 by fire of an unknown origin. The loss probably will run into the thousands.

Chevrolet Breaks Ground—Ground has been broken for the new motor plant of the Chevrolet Motor Co., Flint, Mich. One thousand men are working on the erection and it probably will be ready September 15.

Firestone Enlarges Plant—The Firestone Rubber Co.'s plant at Philadelphia, Pa., which heretofore has occupied a part of a structure known as Industrial Art building, now takes in the whole building, doubling the space used previously.

Another Mohawk Plant Addition—Before the masonry of the Mohawk Rubber Co.'s second factory addition for this year at Akron, O., is scarcely above the surface of the ground, work has been started on a third annex.

Locomobile Employees Share Profits—The Locomobile Co. of America, Bridgeport, Conn., has notified its 3,000 employees that it will share the profits of the concern with them. The plan is to increase the wages proportionately with the increase of product.

Two States for Chevrolet Distributor—The Babbitt-Polson Co., Williams, Ariz., has been appointed distributor for the Chevrolet in Arizona and New Mexico. Sub-agencies will be established in all of the principal cities of the two states.

Daly Resigns from King—Walter L. Daly, formerly sales manager for the King Motor Car Co., Detroit, Mich., has resigned and soon will enter in an individual venture of his own. Assistant Sales Manager Robert P. Bishop moves up and I. B. Meers, former assistant sales manager, again takes his old position.

Purchases Wilcox-McKim Assets—M. L. Wilcox, formerly president and general manager of the Wilcox McKim Co., Saginaw, Mich., has purchased the assets of that concern in the bankruptcy court at Bay City. Mr. Wilcox will reorganize the company and expects to have the plant in operation again soon, when it will continue to make motor car parts.

Hurry-up Transportation for Packard—Bar steel by express and special trains for heavy machinery are methods by which the Packard Motor Car Co., Detroit, Mich., is meeting the problem of turning out twin sixes to keep up with demand. A special transmission boring machine weighing nearly a ton was brought from Worcester,

Mass., recently by express and a few days later a locomotive and one freight car brought a special milling machine from the same city to the Packard plant.

Reading Cycle Increases Capital—The Reading Cycle Co., Reading, Pa., has increased its capital stock from \$5,000 to \$50,000.

Buick Payroll Half Million—The Buick Motor Co., Flint, Mich., paid its employees in July, \$530,934, thus setting a record in its history. Of this, \$293,123 was the payroll during the second half of the month.

Paine Joins Detroit Commercial—William D. Paine, supervisor of sales in zone four for the Maxwell Motor Co., Detroit, Mich., has resigned to become president and sales manager of the Detroit Commercial Co.

Ford Branch Manager Transferred—H. C. Warnholdt, who has been in charge of the Ford branch and service station at Seattle, Wash., has been transferred to the new Wichita, Kan., branch of the Ford Motor Co.

Paige-Detroit Declares Dividend—The Paige-Detroit Motor Co., Detroit, Mich., has declared a cash dividend of 5 per cent for August on the total new capital stock of the concern. This will be paid September 10 to stockholders of record August 31. To date the company has paid 44 per cent divi-

dends this year on its original capital stock of \$250,000.

Ollier Studebaker Director—L. J. Ollier, sales manager of the Studebaker Corporation, Detroit, Mich., has been named as director of the organization.

Cadillac Day at Fair—August 20 will be observed as Cadillac day at the Panama-Pacific Exposition, when 1916 models will be shown for the first time in the state.

Maxwell Distributor Covers Five Counties—The George C. Brinkman Motor Car Co., St. Louis, Mo., has been appointed distributor for the Maxwell in St. Louis, Franklin and Jefferson counties, Missouri, and Madison and St. Clair counties in Illinois.

Scheu Joins White Star—E. A. Scheu, formerly with the Packard Motor Car Co., Detroit, Mich., and the Invader Oil Co., New York, has joined the White Star Refining Co., Detroit, and will look after the lubricating situation there.

Employees to Share Profits—The Central Automobile and Supply Co., Jackson, Mich., has announced that a certain percentage of its profits for the coming year will be set aside to be divided among its employees August 1, 1916.

Branstetter Retails Kissel—H. P. Branstetter, Chicago, who has handled the wholesale business for the Kissel Motor Car Co., covering Illinois and Indiana territory, has been given charge of the retail Kissel business in Chicago in addition.

St. Louis Company Reorganized—The St. Louis Stearns Automobile Co., St. Louis, Mo., has been reorganized and now is known as the Stearns-Knight Automobile Co. The same quarters used by the other company will be occupied by the new concern.

Maxwell-Mitchell Distributor Moves—Increase in business has caused the Wilson Motor Co., Baltimore, Md., distributor of Maxwell and Mitchell cars, to seek larger quarters. A location has been found and the move will be made shortly.

Distributor Entertains Dealers—The Lord Motor Co., Los Angeles, Cal., southern California and Arizona distributor of Maxwells, entertained its dealers last week with a banquet at the Los Angeles Athletic Club, when the 1916 cars were exhibited for the first time in the southern California metropolis.

Packard Assistant Chief Engineer—The Packard Motor Car Co., Detroit, Mich., has appointed H. D. Church, truck engineer for the last 5 years, assistant chief engineer. He is succeeded by H. T. Woolson, formerly chief engineer of the Gas Engine and Power Co., Morris Heights, N. J.

Begin Franklin Plant Addition—Work has begun on the plant addition of the H. H. Franklin Mfg. Co., Syracuse, N. Y., which will increase the company's present floor space by 145,000 feet. Exclusive of machinery the new building will cost about \$200,000.

Briggs-Detroit Property Bought—The Denby Motor Truck Co. has purchased from the Detroit Trust Co., trustee, the property of the bankrupt Briggs-Detroit Co. for \$63,500. This property consists of the factory buildings and about 6 acres of land. The Denby company will move into this plant within the next few weeks.

Keeton Factory Taken Over—The Detroit Metal Refining Co., a new corporation, has taken over the old Keeton factory in Detroit and converted it into a smelting plant. The Keeton plant has been renovated to accommodate the demands of the new tenant, its 2½ acres of buildings being fitted with the modern equipment.

The Show Circuit

Minneapolis Show in Armory—The Minneapolis motor car show will be held in the National Guard Armory, January 29 to February 5, 1916.

Show in Conjunction with Fair—The Columbus, O., motor show will be held in conjunction with the Ohio state fair at Columbus, O., August 20 to September 4.

Reading Show in Hotel—The Berkshire motor show will be held in the Hotel Berkshire, Reading, Pa., September 6-11. This exhibition is the first of its kind to be held in a hotel.

Show Planned for Portland, Me.—Portland, Me., dealers have arranged to hold a motor car show in October. The plans will have the cooperation of dealers from other cities that it may be made a big Maine exhibition.

St. Louis Show October 4-9—The ninth annual show of the Automobile Manufacturers' and Dealers' Association, of St. Louis, Mo., will be held October 4-9 at Forest Park Highlands, a summer amusement park, and will be an open-air exhibit. This will be the week of the veiled prophets conclave.

Show to Feature County Fair—Dealers in Ventura, Cal., will furnish the main feature at the county fair to be held here August 26 to September 1. The exhibit will be housed in a tent, 100 by 210 feet, placed on the race track. Dealers from other cities are expected to take part.

Los Angeles Show—The Broadway Automobile and Flower Show is to be held under the auspices of the motor car dealers of Los Angeles, Cal., late in October. A large percentage of the motor car men already have completed arrangements to show their 1916 models. J. S. Coswell has been named as manager. The committee appointed from the motor car dealers includes Ralph C. Hamlin, P. H. Greer and Earle C. Anthony.

New Garages, Repair Shops and Service Stations

CALIFORNIA		
Town	Firm	Supplies
La Habra	Proud & Olson	Tires
Porterville	Eckard & Niles	Garage
GEORGIA		
Savannah	Georgia Supply Co.	Accessories
ILLINOIS		
Peoria	H. A. Reuling & Son	Garage
MARYLAND		
Baltimore	Beam Motorcar Co.	Service
Baltimore	Tire Mart	Tires
Frederick	Wolfe & Grove	Garage

MINNESOTA		
Town	Firm	Supplies
St. Paul	J. S. Christison	Garage
St. Paul	Moore Transfer Co.	Garage
St. Paul	Michaud Transfer Co.	Garage
Minneapolis	W. L. Harris	Garage
Minneapolis	Simon Kruse	Garage
Duluth	Mutual Auto Co.	Garage

MISSOURI		
Town	Firm	Supplies
King City	King City Auto Co.	Repairs
St. Louis	Sterling Supply & Service Co.	Garage

NEW YORK		
Town	Firm	Supplies
Rochester	Fred J. Zorn	Garage
OHIO		
Youngstown	Thomas Motor Car Co.	Repairs
PENNSYLVANIA		
Philadelphia	Francis Hogarth	Garage
New Kensington	John Ross	Garage
Philadelphia	A. B. de Armond	Garage
Scandia	Fred Anderson	Garage
Philadelphia	Harry Brocklehurst	Garage
Meadowbrook	Howard Macher	Garage

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

CALIFORNIA		
Town	Agent	Make
Barstow	E. L. Stanfield	Studebaker
Chino	Perez & Hannigan	Overland
Coalinga	Eagle Garage	Overland
Coalinga	C. C. Kratzer	Buick
Coalinga	C. C. Kratzer	Chevrolet
Coalinga	C. C. Kratzer	Winton
Coalinga	Martin Garage	Oldsmobile
Coalinga	Spear Bros.	Dodge
Los Angeles	Oldsmobile Co. of Cal.	Oldsmobile
Oxnard	Oxnard Garage	Hudson
Oxnard	Oxnard Garage	Dodge
Porterville	J. E. Dorsey	Briscoe
Porterville	M. S. Ough	Metz
Porterville	J. W. Stephens	Dodge
Santa Ana	Charles B. Perry	Kisselkar
Santa Barbara	L. H. Boydston	Studebaker
Santa Barbara	H. Grant Connor	King
San Francisco	Oldsmobile Co. of Cal.	Oldsmobile
San Francisco	C. W. Hobson	King
Van Nuys	Lemay & Lewis	Overland
Van Nuys	Van Nuys Garage	Chevrolet
Van Nuys	L. L. Whitson	Studebaker
Ventura	Claude C. Needham	Ford
COLORADO		
Akron	M. W. Lewis	Saxon
Arvada	Arvada Motor Car Co.	Dort
Aspen	Gerbaz & McPhee	Saxon
Boulder	B. C. Garbarino	Saxon
Broomfield	Walter W. Wilcox	Reo
Cheyenne Wells	T. C. Turner	Dort
Colorado Springs	Rouse & Stevens	Packard
Colorado Springs	Big Four Auto Co.	Dort
Colorado Springs	Beecher Motor Co.	Saxon
Colorado Springs	Beecher Motor Co.	Reo
Craig	Anderson E. Brokaw	Saxon
Cripple Creek	E. J. Williams	Dort
Cripple Creek	Clark Supply Co.	Saxon
Deertrail	D. I. Williams	Dort
Denver	E. J. Johnson	Chalmers
Denver	W. W. Beeson	National
Denver	Colorado Motor Car Co.	Cole
Denver	Regal Sales Co.	Regal
Denver	Regal Sales Co.	King
Denver	Regal Sales Co.	Jackson
Denver	L. G. Palmer	Paige
Denver	John Deere Plow Co.	Vellie
Durango	Durango Novelty Works	Saxon
Edwards	A. W. Burnison	Paige
Elbert	Theodore Neuman	Buick
Flagler	William Seal	Saxon
Fort Collins	G. Harold D. Parker	Saxon
Fort Collins	Jackson-Ankney Merc. Co.	Reo
Fort Collins	J. C. Hunt	Paige
Fort Collins	G. Harold D. Parker	Buick
Fort Morgan	A. C. Gillette	Reo
Glenwood Springs	Bart Patrin	Cole
Grand Junction	West. Colo. Motor Sales Co.	Paige
Greeley	Lee Bros.	Dort
Gunnison	W. A. Keeler	Paige
Greeley	Weld County Garage	Buick
Greeley	J. B. McOutcheon	Reo
Hayden	Dawson Auto Co.	Cole
Holyoke	Holyoke Auto Co.	Buick
Holyoke	G. W. Garland	Saxon
Hugo	Cobb & Hatton	Saxon
Idaho Springs	Richard E. Staley	Paige
Lamar	Miller Bros.	Reo
Lamar	Hartman Auto Co.	Saxon
Las Animas	F. W. McCune	Reo
Leadville	O. W. Reynolds	Cole
Longmont	Shaw & Shickle	Saxon
Loveland	Anderson & Griffin	Reo
Loveland	Stewart & McFadden	Saxon

MISSOURI		
Town	Agent	Make
Monte Vista	Stephens & Corrington	Paige
Norwood	Galloway & Goldworthy	Buick
Paonia	Joseph Carlstrom	Paige
Placerville	M. B. Stone	Dort
Pueblo	Silver State Auto Co.	Oakland
Pueblo	Pueblo Auto Co.	Reo
Pueblo	Spitzer Bros.	Paige
Rocky Ford	J. C. Cartwright	Reo
Steamboat Springs	L. J. Brown	Oakland
Timnath	Giddings & Carey	Cole
Trinidad	George D. Single	Paige
Trinidad	Trinidad Garage Co.	Cole
Trinidad	Mack Patterson	Saxon
Windsor	H. E. Hickman	Paige
Windsor	L. A. Bartz	Reo
Yuma	L. J. Titterton	Dort
Yuma	Heiserman & Mouser	Saxon

FLORIDA		
Town	Agent	Make
Orlando	J. P. Holbrook	Hupmobile
Palatka	Palatka Auto & Supply	Hupmobile
Tallahassee	James Masser	Hupmobile

GEORGIA		
Town	Agent	Make
Eastman	F. A. Roberts	Hupmobile

ILLINOIS		
Town	Agent	Make
Chicago	H. P. Branstetter	Kisselkar
Hardin	Elmer E. Williams	King
Kankakee	E. A. Jeffers	Kisselkar
Thomasboro	T. T. Hewerts & W. J. Ehler	Hupmobile

INDIANA		
Town	Agent	Make
Evansville	B. M. Lindsey	Kisselkar
Fort Wayne	John C. Pennell	Ford
Roann	J. E. Clingaman	Oldsmobile
Warsaw	F. L. Evans	Hupmobile

IOWA		
Town	Agent	Make
Glidden	E. O. Potter	King
Humboldt	Palms & Son	Hupmobile
Tipton	C. N. Wallick	Hupmobile
Winterset	Winterset Kisselkar Co.	Kisselkar

KANSAS		
Town	Agent	Make
Cawher City	P. H. Schroeder	Hupmobile
Lawrence	Lawrence Auto Co.	Hupmobile

MASSACHUSETTS		
Town	Agent	Make
Boston	Becker-Stutz Co.	Stutz
Boston	W. S. Jamison	Rauch & Lang

MICHIGAN		
Town	Agent	Make
Alma	Nelson A. Smith	Hupmobile
Benton Harbor	Charles Heim	Reo
Cadillac	McDonald Sales Co.	Ford
Dowagiac	Pinkham Auto Co.	Ford
Linden	C. A. Sutliff	Studebaker
Linden	C. A. Sutliff	Hollier
Kalamazoo	Ross Thompson	Cornellian
Midford	C. A. Fitzgerald	Overland
Jackson	Briscoe Motor Sales Co.	Chalmers
Pigeon	Leipprandt Bros.	Dort
Grand Rapids	Riley Traxler	Winton
Grand Rapids	Western Michigan	Oakland
Paw Paw	Packer & Giddings	Ford
Port Huron	Standard Auto Co.	Patterson
Richmond	M. E. Fitzgerald	Ford
St. Johns	S. N. Shaffer	Hupmobile

MINNESOTA		
Town	Agent	Make
Kasson	Ottensness Bros.	Oldsmobile
Lewiston	F. E. Franks	Oldsmobile
Minneapolis	Barclay Auto Co.	Kisselkar
Glenwood	E. W. Brokaw	King
Long Prairie	Hansman Auto Co.	King
Fairfax	Reuben Sell	Hupmobile

COMMERCIAL CARS

DISTRICT OF COLUMBIA

ALABAMA		
Town	Agent	Make
Birmingham	Capitol Park Auto Co.	Vim
CALIFORNIA		
Los Angeles	Albert L. Brush	Vim
CONNECTICUT		
Bridgeport	John L. Carpenter	Vim

OHIO		
Town	Agent	Make
Columbus	Brasher Motor Car Co.	Vim
MASSACHUSETTS		
Plymouth	G. R. Briggs	Vim

MISSOURI		
Town	Agent	Make
Kansas City	Chamberlain & Goodloe	Vim
NEW YORK		
Jamestown	Cole & Backus	Vim
WISCONSIN		
Fond du Lac	E. W. Clark Co.	Vim
Milwaukee	Chase Motor Truck Service	Vim

Albany, N. Y.—Auto Heater & Ventilator Corp.; to deal in heating, ventilating cooling apparatus; capital stock \$10,000; incorporators, E. Tillman, and H. and C. Higgen.

Albany, N. Y.—East River Eagle Garage Co.; to deal in cabs, machinery, etc.; capital stock \$5,000; incorporators, Henry Herz, Henry G. Rindall and Giuseppe Fusco.

Albany, N. Y.—Safety Steering Device Co.; to manufacture safety devices for motor cars; capital stock \$15,000; incorporators, C. Plauvelt, L. H. Tasker and H. C. Miller.

Amarillo, Tex.—Western Motor Co.; capital stock \$1,000; incorporators, C. H. Dixon, W. L. Fore and C. C. Chenoweth.

Austin, Tex.—Thompson Motor Car Co.; capital stock \$15,000; incorporators, G. A. C. Half, E. J. H. Lanham and R. M. Thompson.



Boston, Mass.—American Aircraft Co., Ltd.; capital stock \$100,000; incorporators, E. G. Davis, Joseph Weeks and F. W. Partsch.

Boston, Mass.—New England Patterson Co.; motor car manufacturing and repairing; capital stock \$50,000; incorporators, E. W. Vining, Harold D. Wilson and J. E. Perry.

Boston, Mass.—Polack Tyre & Rubber Co.; capital stock \$2,000; incorporators, John F. Crowley, E. G. Shumway and H. Hoffstaeder.

Braintree, Mass.—M. C. M. Garage; capital stock \$20,000; incorporators, A. D. Martin, John A. Clark and G. L. Ellsworth.

Brooklyn, N. Y.—Bell Rubber Co.; to manufacture rubber goods, tires, etc.; capital stock \$20,000; incorporators, William O. Gelsman, Anna Gelsman and Sarah F. Schroeder.

Brooklyn, N. Y.—Surplus Motor Parts Co.; to deal in motor car machinery, etc.; capital stock \$1,000; incorporators, Samuel S. Waldman, Harold Obst and Joseph Sokoloff.

Where Dependability Counts

On the long, hard pull you appreciate Champion Spark Plugs.

They have the *built-in* ability to withstand the terrific force of those hill crest explosions.

We subject each separate Champion Plug to every conceivable test in the motor for which it is intended. It is exhaustively tried at every brake load—every speed.

It receives test after test until we know it will stand up

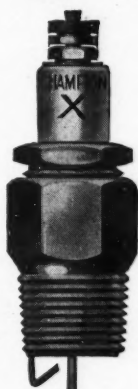
under the greatest stress.

75% of all American made motors for every purpose are equipped at the factory with Champion Spark Plugs.

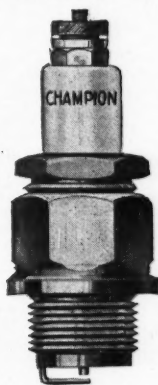


Champion

"TOLEDO MADE FOR THE WHOLE WORLD'S TRADE"



Champion X
Special 1/2 inch
Price 75c
Factory Equipment on
all Ford cars
since 1911



Champion
Regular
3/8-18 Long
Price \$1.00
Standard Factory
Equipment for Max-
well cars.



Champion
Heavy Duty
1/2 inch
Price \$1.00
All Studebaker cars
are equipped at the
Factory with this plug.

It will pay you to be guided by the opinion of the country's greatest automobile engineers. Equip your motor with Champions.

There is a Champion specially designed for every motor. Be sure to get the

right Champion for your car.

The Champion Guarantee—Complete satisfaction to the user, free repair, replacement or money back.

Champion Spark Plug Co.

1514 Upton Avenue Toledo, Ohio

Dealers—If you did not secure out profit-sharing contract for all of 1915, do not fail to secure one effective for the last 6 months of the year. See your jobber's salesman or write direct to us.



SCHEBLER

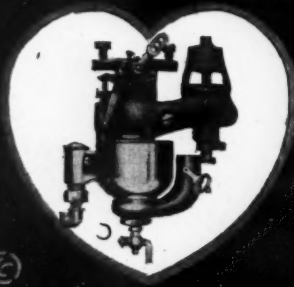


Dependable in any emergency

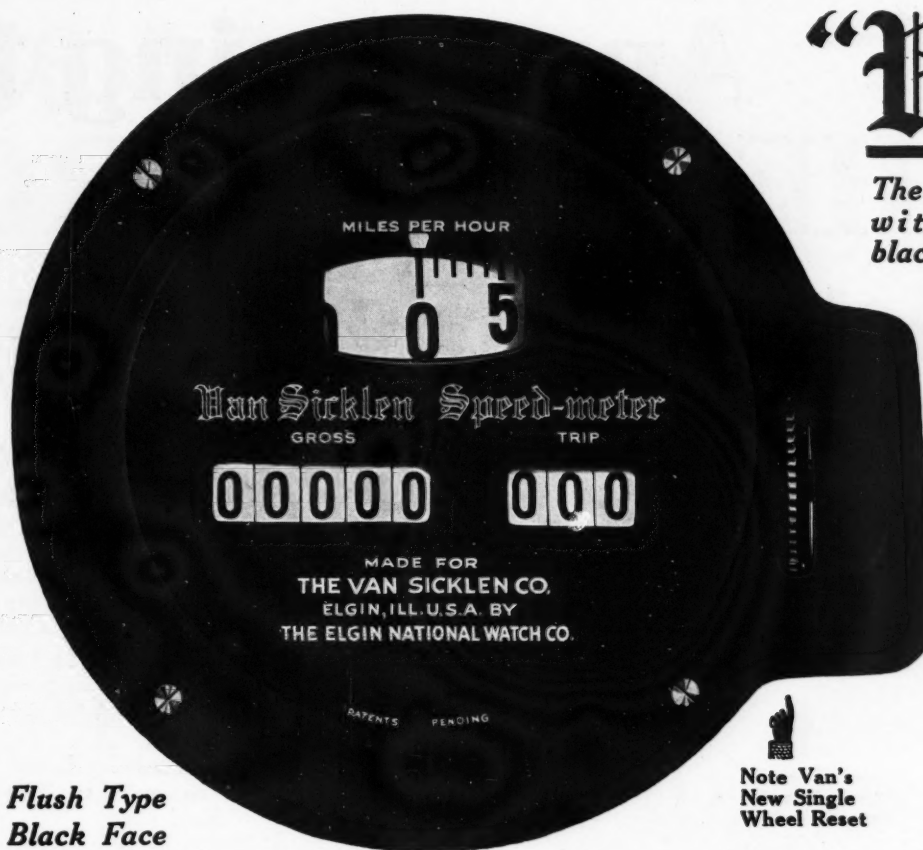
Fire engines - fire insurance patrols—police and hospital ambulances—in fact most motor vehicles upon whose *prompt* and *certain* arrival depends the property, the lives, the safety of the commonwealth, are regularly equipped with SCHEBLER—

The Universal Carburetor

In the illustration a Schebler-Equipped Fire Engine is shown in action. In the choice of a carburetor for your car let yourself be guided by the judgment of those who deem the best obtainable just good enough. Demand SCHEBLER!



Wheeler & Schebler
Indianapolis • Indiana



"Van"

*The speed-meter
with the big
black figures*

*Flush Type
Black Face
Actual Size*

**Note Van's
New Single
Wheel Reset**

The NEW DETROITER—in keeping with a policy of installing none but the more advanced equipment—in 1916 will have Van keeping the mileage books.

"Built Like a Watch---by Watch Makers"

THE VAN SICKLEN COMPANY

GENERAL OFFICES:
14 Chicago St., Elgin, Ill.

FACTORY:
Elgin National Watch Co.

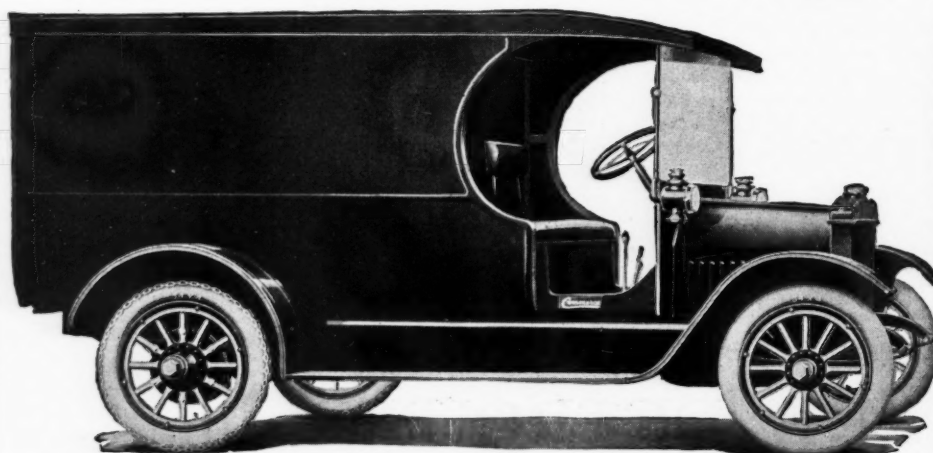
Factory Representatives: Cutting, Armstrong & Smith Sales Co., Detroit, Mich., for the States of Michigan, Ohio and Indiana

General Distributors: The Beckley-Ralston Company, Chicago

Eastern Distributors: A. J. Picard & Co., 1722 Broadway, New York City

Foreign Distributors: Mestre & Blatge, 20 Store St., Tottenham Ct. Rd. W. C., London, England

Announcing the THE COMMERCE Complete with Bodies as Sh Capacity,



Model "N. C." with Tail Gate or Rear Doors, Complete, \$975.00

To the dealer who has read the foregoing specifications, no further word is necessary as to the desirability of the **Commerce** line. Six years of successful manufacturing have built up for us a splendid organization of representative dealers throughout the country. You can eliminate competition in your field with the **Commerce** agency.

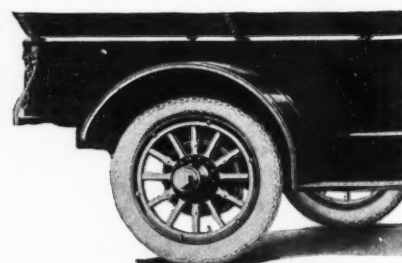
SPECIFICATIONS

Wheel Base, 120 Inches.
Loading Space, Seven Feet
Continental Motor, 3½ in.
x 5 in.
Cast Tank Radiator
34 in. x 4 in. Tires, Non-
Skid Rear
Eisemann Water-Proof Mag-
neto
Demountable Rims — Spare
Rim
Truck Type Transmission

Chassis Including All Equip-
ment, Less Body,

\$875.00

Commerce Trucks Are ALL
FITTED WITH Windshield,
Lamps, Horn, Tools and Storm
Curtains.

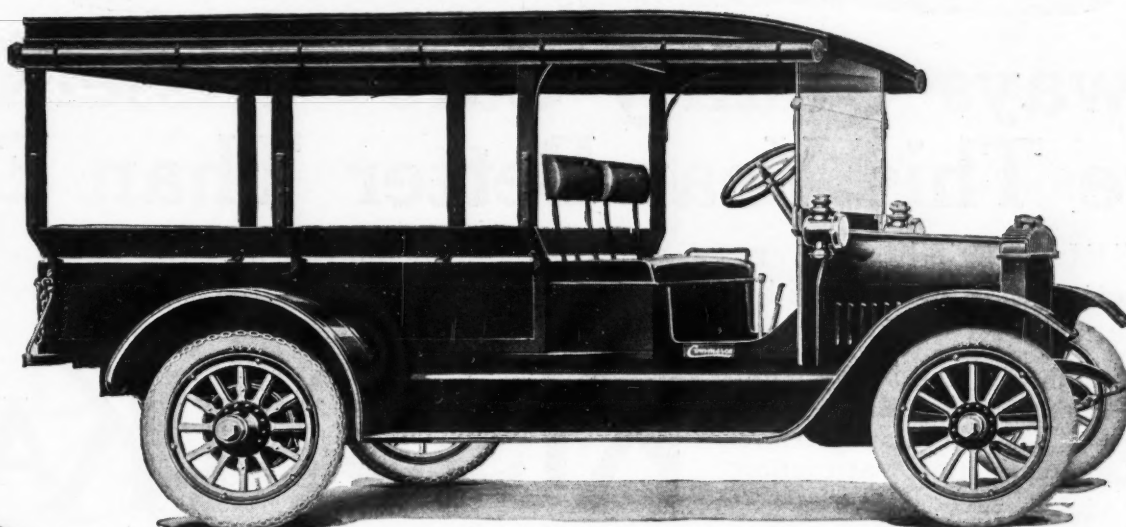


Model "N. A."

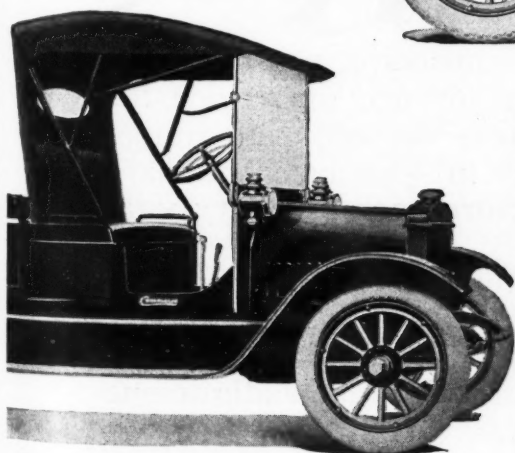
COMMERCE MOTOR CAR COMPANY,

1916 Models of MOTOR TRUCK

own, \$975.00 F. O. B. Detroit
1500 Pounds



Model "N. H." Fully Equipped, \$975.00



Fully Equipped, \$975.00

Detroit, Mich.

TO THE DEALER

Fill in the following, detach and mail to us today. By return mail, you will receive complete information.

Name..... Address.....

Now handling.....

Do you operate salesroom?..... Garage?.....

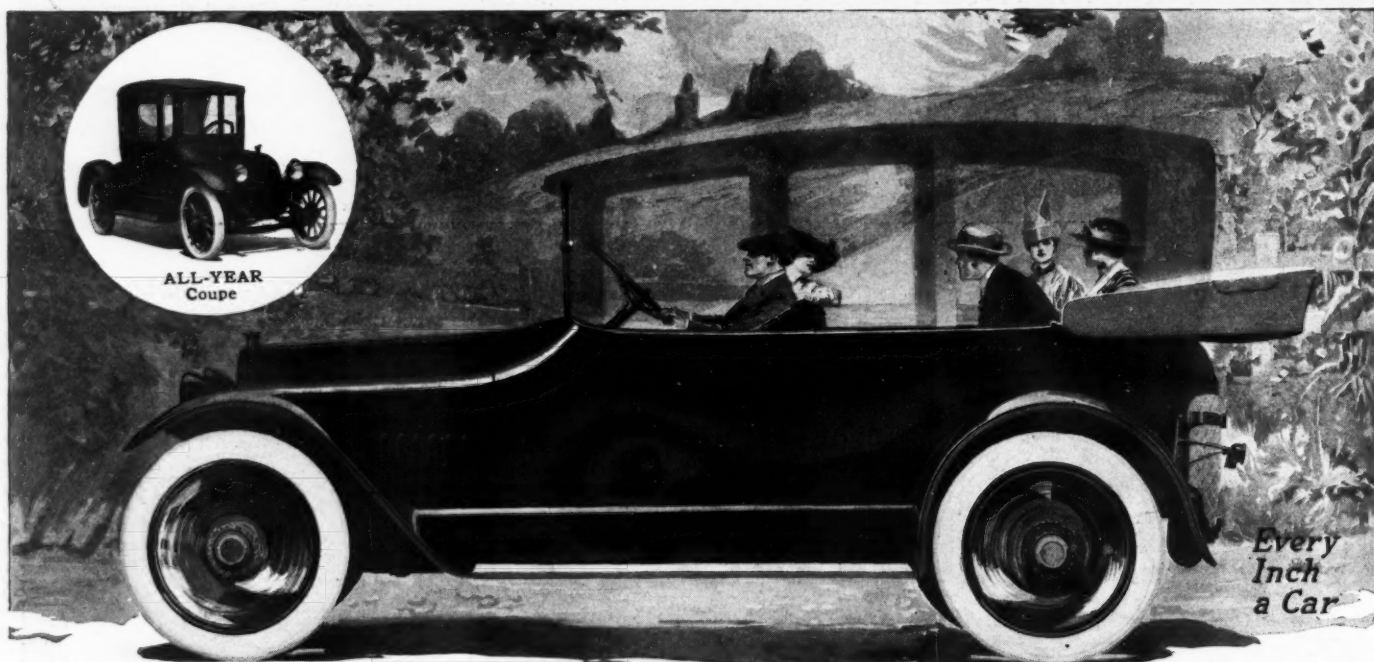
Do you desire dealers' proposition?.....

Territory desired.....

Trucks sold past year..... Make

Mark your envelope "Dept. H"

When Writing to Advertisers, Please Mention Motor Age



Always Quality Cars—KisselKars Are This Year Better Than Ever

KISSELKARS always were cars of pronounced quality and the new models are **better than ever.** Evidence of their superiority is unmistakably reflected from every angle—in construction—appearance—finish—performance.

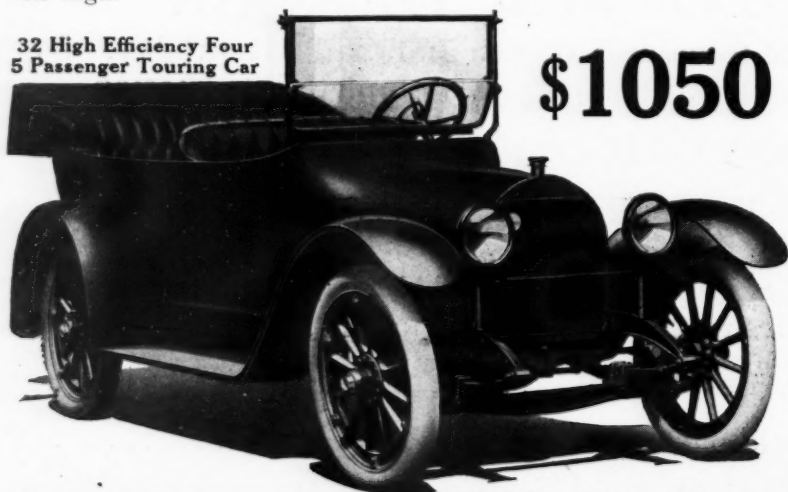
And looming in the background is the perfected ALL-YEAR Car—an original feature that gives a KisselKar distinction, attraction and utility exclusively its own.

Kissel-built motors are a revelation in infinite smoothness of motion—vibrationless action—even flow of power—silence and ability to master all grades “on high.”

KISSELKAR

THE new KisselKars measure up to those standards that give assurance of service far beyond the average, because the enduring things are **built in**—because they are manufactured cars in every vital part.

Therefore, there is deep significance in the fact that bigger plans and increased output have brought about a new alignment of prices, including a Four at \$1050 and a Six at \$1485.



Kissel Motor Car Company

New York, Chicago, Boston, St. Louis, Cleveland, Milwaukee, Minneapolis, St. Paul, Buffalo, Pittsburgh, Cincinnati, Columbus, Toledo, San Francisco, Los Angeles, New Orleans, Dallas, Omaha, Nashville, Rochester,

THE ALL-YEAR Car—invented, named and introduced by Kissel—was the paramount achievement in body design last season. It met for the first time a demand for continuous service of one body—an open touring car in summer and closed car in winter. The top is easily attached and detached by in-expert men.

The new ALL-YEAR Cars are perfection—beautiful Rothschild lines, masterly workmanship—worked out so skillfully that not even an expert can distinguish them from the finest closed coach in passing.

In addition to the ALL-YEAR Sedan Top, there is a new ALL-YEAR Coupe Top mounted on the **smartest four passenger roadster yet conceived**. Style—beauty—utility—a jimdandy in looks and smartness and at the same time the most practical car you ever saw.

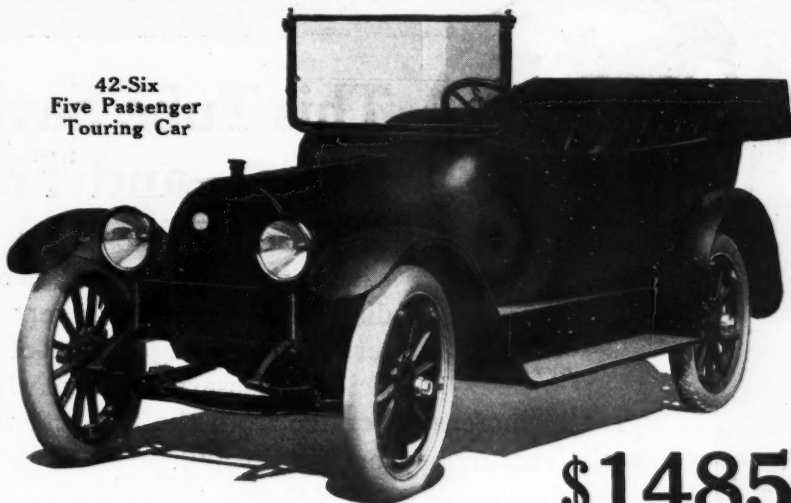
The ALL-YEAR Car

The complete KisselKar line—including the new 32-Four, 36-Four, 42-Six, five and seven passenger four door, two and three door corridor bodies, ALL-YEAR Touring and Sedan Bodies, ALL-YEAR Roadster and Coupe bodies, Limousines and Coupelets—is fully described in our new literature just off the press. Write for complete facts and learn the full significance of KisselKar values and prices, as well as the comforts and conveniences of the ALL-YEAR models.

121 Kissel Ave., Hartford, Wisconsin

Troy, Dayton, New Haven, Hartford, Conn., Providence, Marshalltown, Cedar Rapids, Montreal, Calgary, Victoria and hundreds of other leading cities in the United States and Canada.

42-Six
Five Passenger
Touring Car



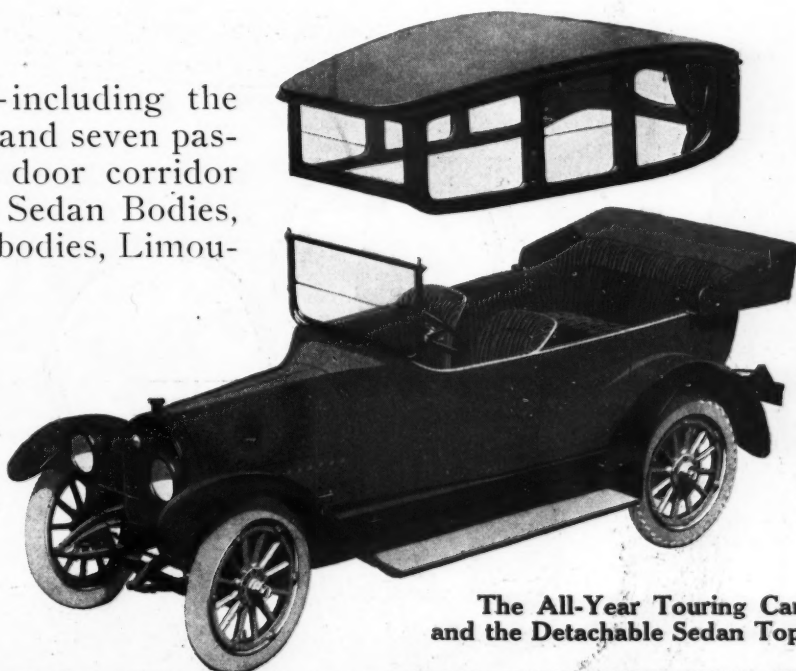
\$1485

The Unmatched Car at the Price— The **KISSELKAR** Six

"A great Six—nothing to compare with it for the price"—that was the verdict of motordom on the KisselKar 42-Six last season. And for looks—remember the beautiful yacht-like lines of that model? Then try mentally to picture an even handsomer design. You will find your picture realized when you see this car.

The 36-Four is another model that won its spurs last year as a car of brilliant performance. It was the original two-door corridor car and in that form and as a roadster it is again offered—with substantial refinements.

The 32 High Efficiency Four is in every respect a new car—a smaller KisselKar with all the mechanical, MANUFACTURED goodness of the larger models and at a wonderful price, value considered.



**The All-Year Touring Car
and the Detachable Sedan Top**



This Tube Saves Tires—Time—and Trouble

It permanently closes cuts and holes in the casing against the entrance of water, oil and dirt. It reduces tire repair to the simplest terms, by making the use of a cement and mastic unnecessary. Regularly used, it insures

greatly increased service from the tire and thus saves the motorist real money on his tire bill.



J-M Narco Tire-Cut Filler

J-M Narco Tire-Cut Filler is a semi-liquid rubber compound, rich in real Para Rubber and positively free from harmful ingredients. It makes a permanent repair that no road abuse can destroy. This is because J-M Narco Tire-Cut Filler literally welds itself to the walls of the cut and rivets the loosened tread to the fabric, forming a perfect union. J-M Narco Tire-Cut Filler heals to a resiliency as great as that of the tread itself. It sets over night. All that is necessary to apply it is to cleanse the cut thoroughly with gasoline—insert the tapered spout—compress the tube—smooth off the filler—and the repair is complete.

J-M Narco Tire-Cut Filler does away with the troublesome kneading of a mastic. It provides the easiest, cleanest and most logical method of tire repair.

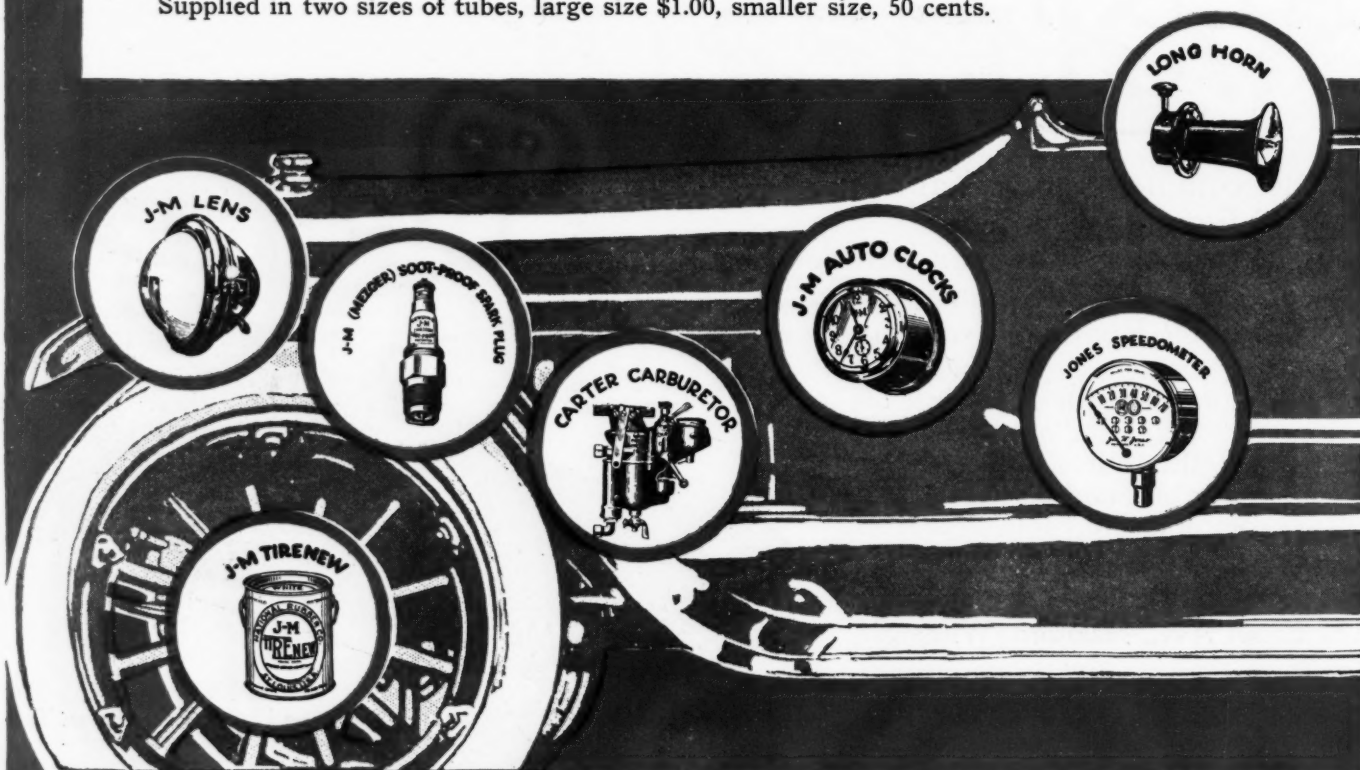
Get a tube at your dealer's and try it.

Supplied in two sizes of tubes, large size \$1.00, smaller size, 50 cents.

J-M

Tirenew

Another J-M Narco product that prevents tire decay and restores the fresh, clean, smart appearance of a new shoe. Not a paint, but a liquid rubber compound that you apply with a brush. Supplied in either "white" or "tire gray" in cans 12 oz., 1 quart, ½ gallon and 1 gallon. There are imitations which paint but which do not protect—insist on J-M Tirenew.





The Voice of This Horn Is Insured!

Should any part of the sound-producing mechanism fail at any time after purchase, we will give you a new horn. This positive guarantee covers every

Model "J" Long Horn

Substantial, not only in appearance, but in construction. Hardened, machine-cut gears, ball-bearing vibrator.

A slight pressure of the hand on the knob produces a powerful, far-reaching warning

note that never fails.

Other horns may compete on price but not on quality, as is evidenced by the above guarantee. See a Long Horn dealer and write for booklet.

H·W·JOHNS - MANVILLE CO.

Akron
Albany
Atlanta
Baltimore
Birmingham

Boston
Buffalo
Chicago
Cincinnati
Cleveland

Columbus
Dallas
Dayton
Denver
Detroit

Duluth
Galveston
Houghton
Houston
Indianapolis

Kansas City
Los Angeles
Louisville
Memphis
Milwaukee

Minneapolis
Newark
New Orleans
New York
Omaha

Philadelphia
Pittsburgh
Portland
Rochester
St. Louis

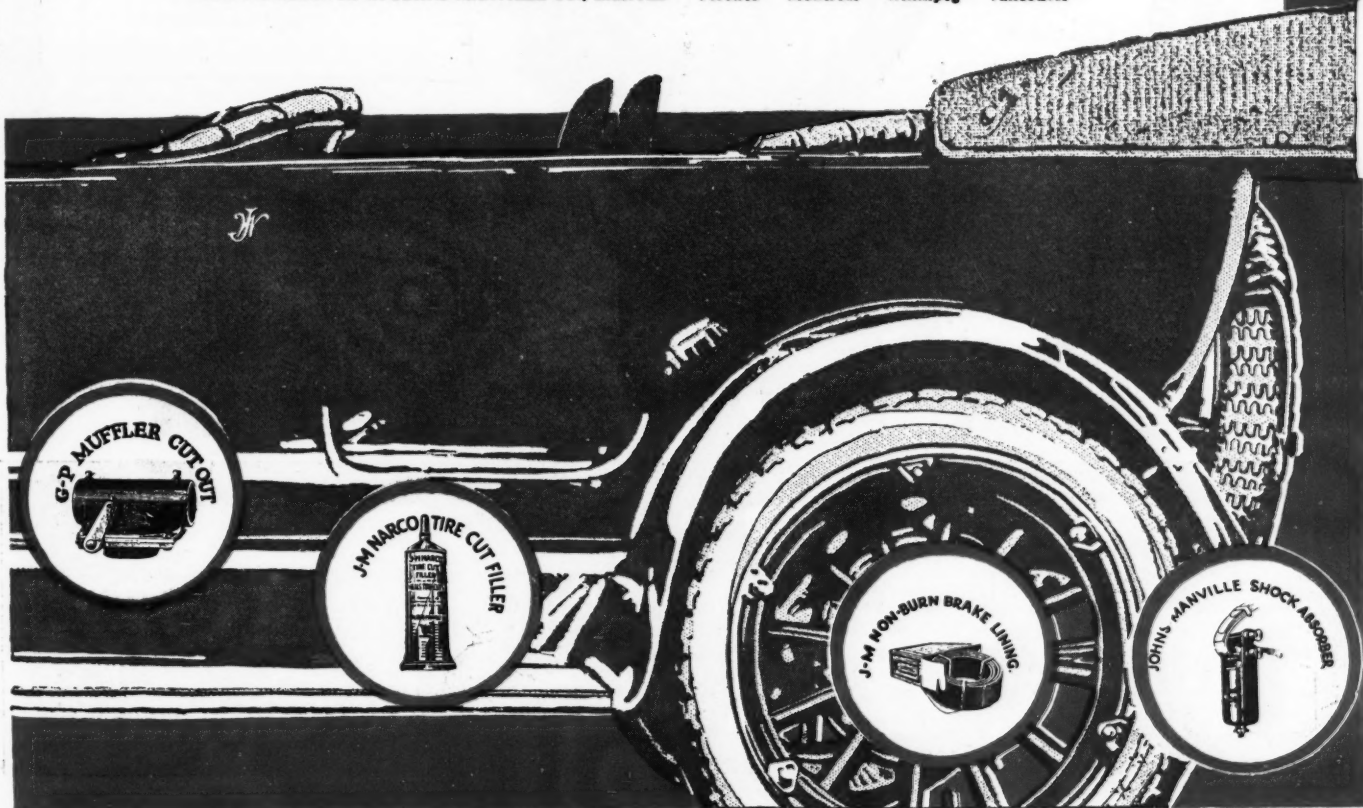
St. Paul
Salt Lake City
San Francisco
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Toledo
Washington
Wilkes-Barre
Youngstown

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto Montreal Winnipeg

Vancouver



When Writing to Advertisers, Please Mention Motor Age

"It is a pleasure to drive a machine that I do not have to stop & visit Each bearing to see how they are getting along." Ed. Demorest

Care-free service, dependability and other inherent qualities cause Hyatt Roller Bearings to withstand the hardest usage in farm tractors as well as in automobiles. These facts are revealed by this straightforward letter from Mr. Demorest.

A tractor is a motor vehicle that is taking the place of the draft horse on the farm, as the automobile has replaced the driving horse on the streets.

It is used at the hardest work—drawing plows, road grading, pulling stumps, dragging logs—work that causes constant and enormous loads and strains upon bearings.

Yet, under these, the most severe tests to which bearings may be subjected, Hyatt Roller Bearings give care-free service. And in the same measure as Hyatt Bearings give care-free service in farm tractors, so do they give care-free service in automobiles.

The experience of thousands of people all over the world who drive Hyatt-equipped automobiles has been that they, too, do not have to give the "bearings a thought." As one prominent car builder has said: "The better the bearings the less the owner knows about them."

Hyatt Quiet Bearings give care-free service because of their distinctive spiral roller construction. They are self-cleaning and self-lubricating, which minimizes wear. Adjustment, therefore, never is necessary. Lubricated occasionally, Hyatt Bearings run indefinitely without further attention.

In these ways Hyatt Bearings render the care-free, dependable service that has caused their use in the great majority of all automobiles manufactured, from the lowest priced four to the highest priced twelve.



Detroit
Chicago
Newark, N. J.



Delaware, Ohio,
March 29th, 1915.

Hyatt Roller Bearing Co.,
Chicago.

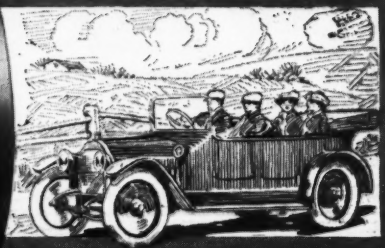
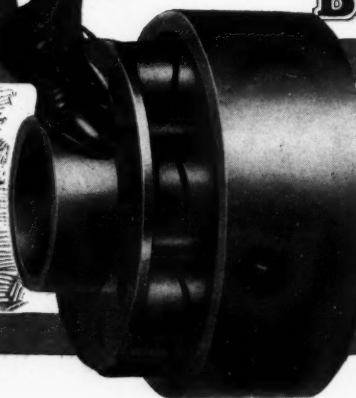
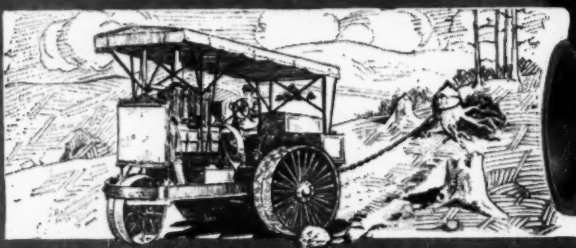
Gentlemen: I have received several letters from you, but neglected to answer. I have not had the bearings out since I built the tractor; of course I never give them a thought. I have pulled three plows 9 inches deep for seven hours without a stop except corners, which are turned as quick as any team of horses.

In building the present machine I used five of your bearings out of the old machine, which I had driven one year; they showed no sign of wear to speak of. I expect to take this machine down after the busy season. We have a country job on road grading that will last till the middle of April and I will plow then till first of May. I have been using the tractor recently in a clearing pulling stumps, dragging logs, etc. I will let you know later how the bearings look. It is a pleasure to drive a machine that I do not have to stop and visit each bearing to see how they are getting along.

Yours, without a struggle,
ED. DEMOREST.

HYATT

ROLLER BEARINGS



SAXON "SIX"



Over 22,000 Saxons in Use

*and we are shipping
120 cars a day*

More than 22,000 Saxon cars are giving good service to owners these pleasant summer days. Thus, the Saxon Company establishes another record.

Shipments of Saxon "Sixes" and Saxon Roadsters are averaging 120 cars a day.

The Saxon Motor Company now ranks among the largest producers of automobiles.

We are today the largest producers of low priced "Sixes" in the industry.

The above mentioned signs of Saxon prosperity are naturally of interest to every automobile dealer. They indicate that in doing business with the Saxon Motor Company you as a dealer associate yourself with a firm that is producing two types of motor cars with the widest possible appeal—and that you will be able to get cars for delivery in large quantities in the best selling seasons.

Why not write today and learn the Saxon dealer opportunity in territory now open. Address Dept. M

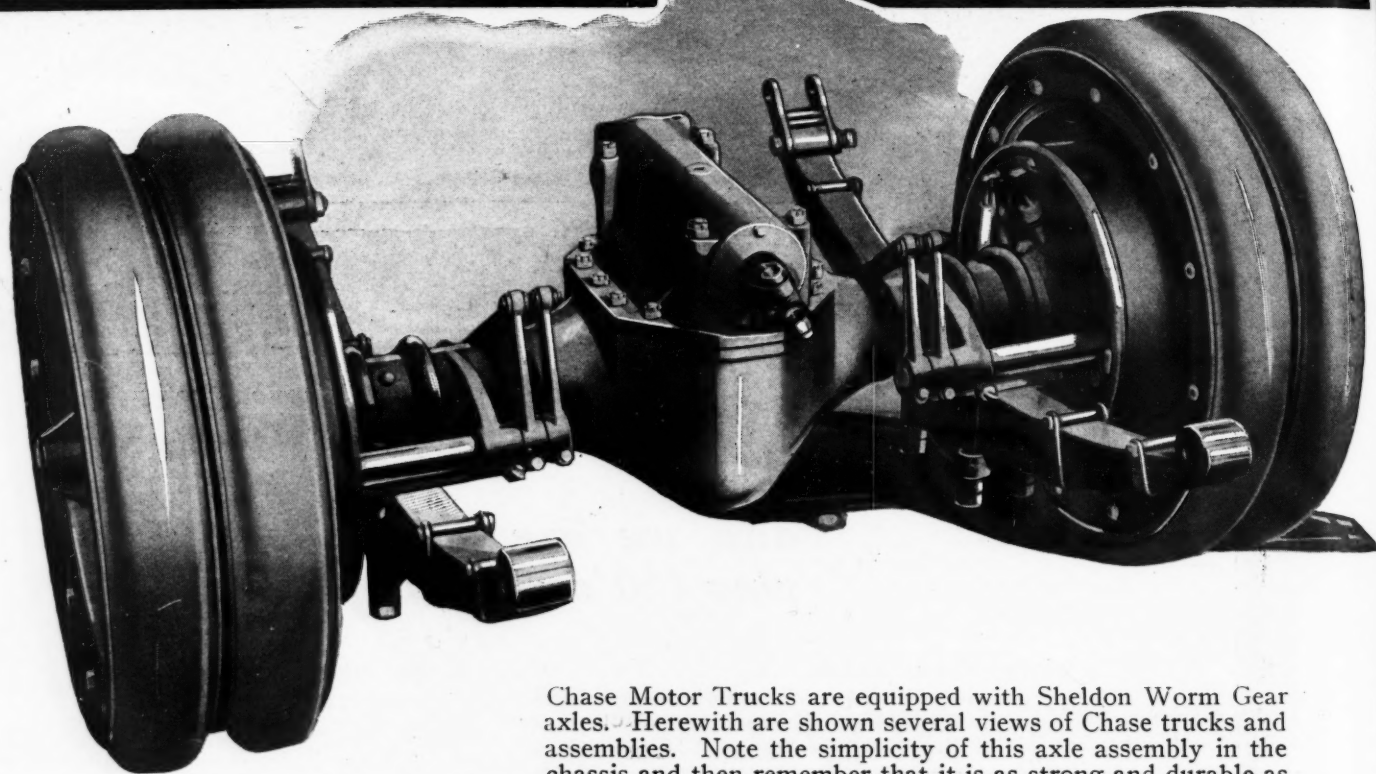
Saxon Motor Co., Detroit

(82)



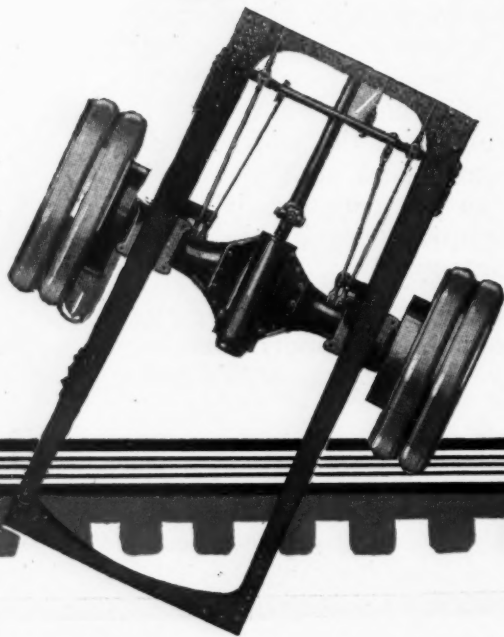
SHELDON

WORM GEAR



Chase Motor Trucks are equipped with Sheldon Worm Gear axles. Herewith are shown several views of Chase trucks and assemblies. Note the simplicity of this axle assembly in the chassis and then remember that it is as strong and durable as it is simple—and that Sheldon worm gear axles deliver up to 97 per cent of power applied.

This remarkable efficiency is due not alone to the general superiority of materials used and manufacturing methods employed, but basically to the design upon which these worm gear rear axles are built.



THE SHELDON AXLE AND

Makers of Springs and Axles for Heavy Duty Service

WILKES-BARRE

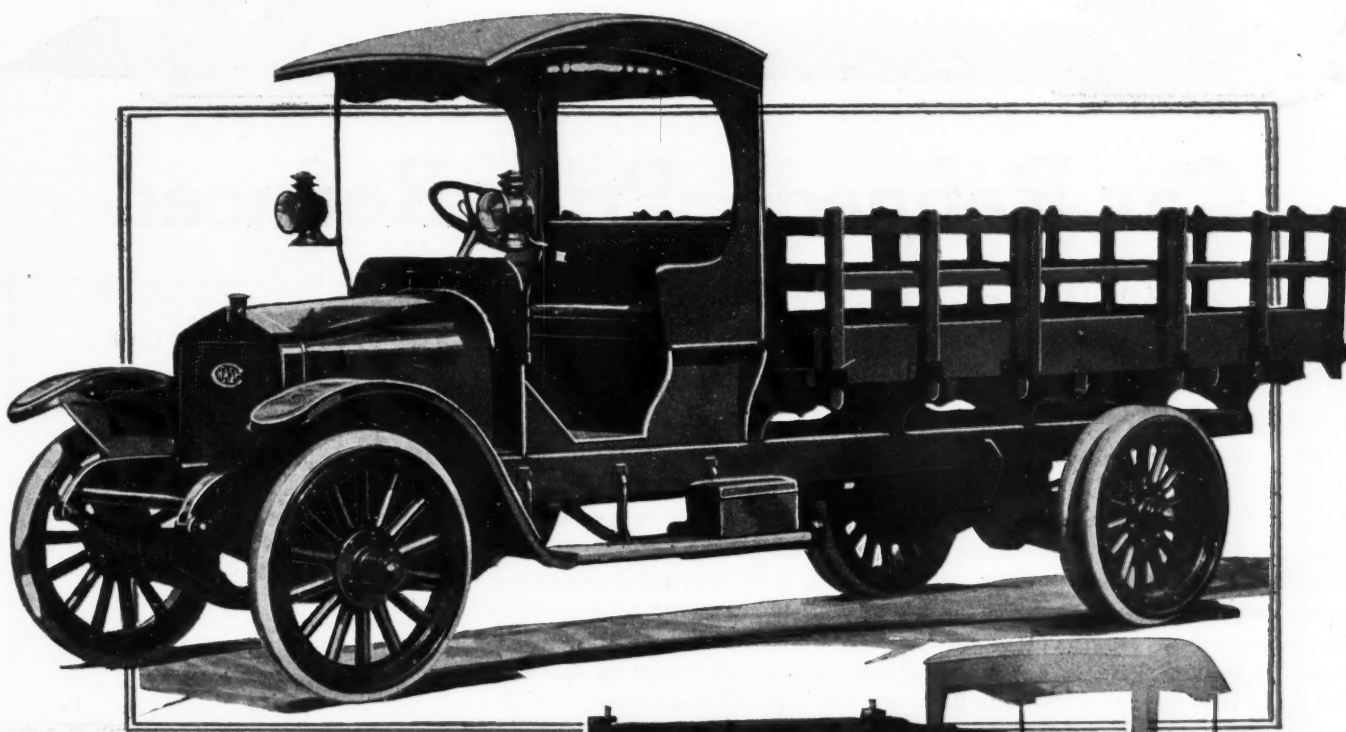
Chicago: 122 S. Michigan Blvd. Detroit: 1215 Woodward Ave.
Exhibition Section 16, Transportation Building.

SHeldon

EAR AXLES



Two of the prime characteristics of Sheldon design are first the use of ball bearings to carry the worm loads (both thrust and radial) and secondly the employment of the semi-floating type of construction.



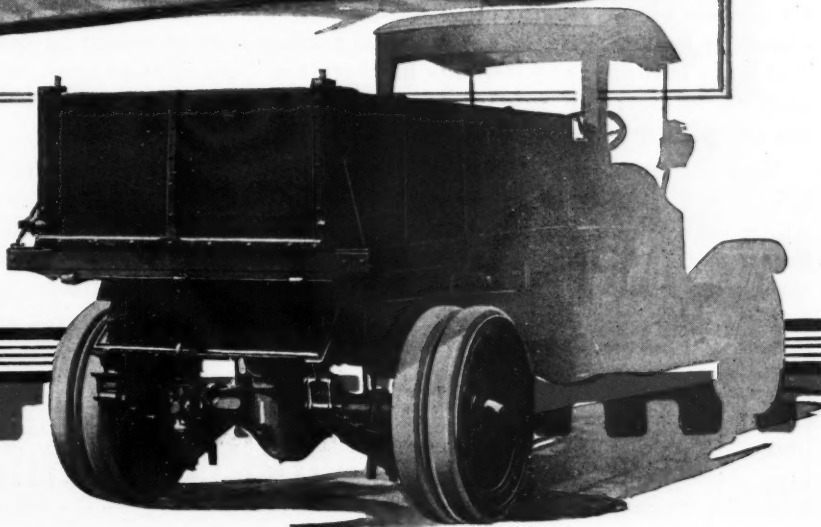
SPRING COMPANY

for More than 50 years.

San Francisco:
444 Market St.

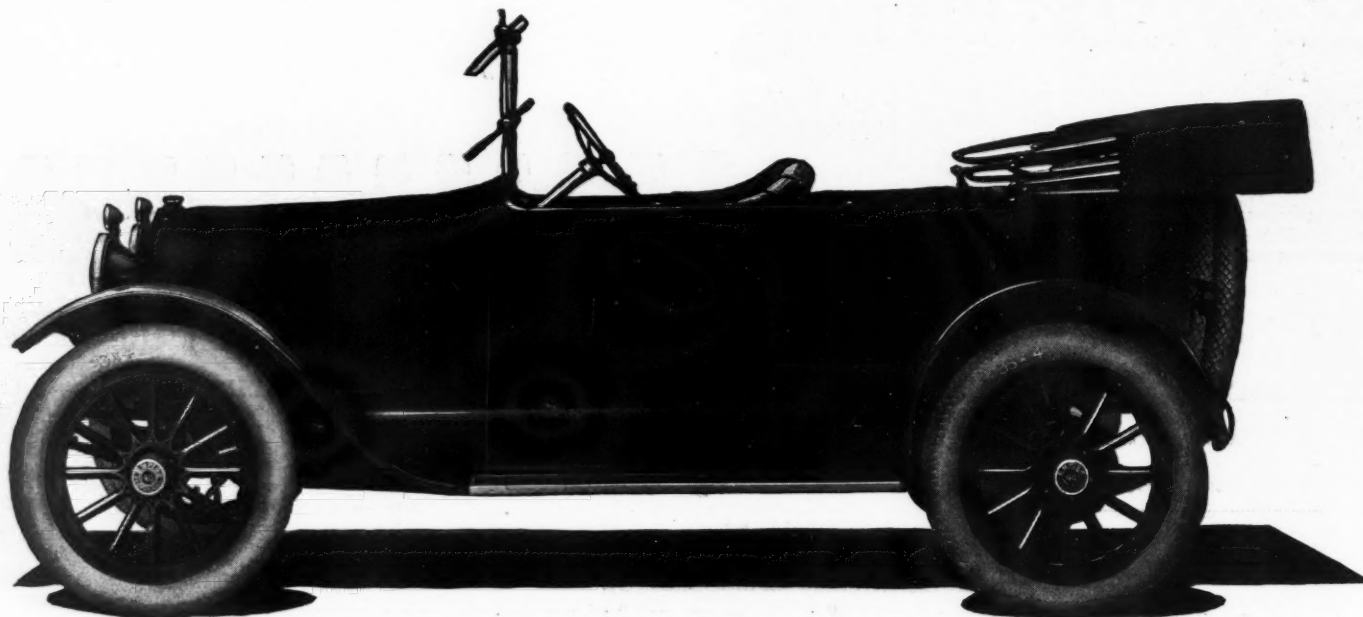
PENNSYLVANIA

Panama-Pacific Exposition, San Francisco.



When Writing to Advertisers, Please Mention Motor Age

EMPIRE "FOUR" \$895⁰⁰



Car Refined—Price Reduced

ALTHOUGH higher powered than any previous four cylinder Empire and much refined throughout this latest Empire—Model 40—is greatly reduced in price. At \$895.00 this big, powerful car offers tremendous value—an outstanding value that will be apparent to buyers and of advantage to Empire dealers.

Whatever standards you may have had for judging a car below \$1000.00 must be revised to appreciate this new Empire. It is a car that by its appearance will instantly appeal to your customers and by sheer performance convince them of exceptional ability—for under the hood is a highly efficient, four cylinder, $3\frac{7}{8} \times 5$, T-head motor that develops 43 horsepower, an average of one horsepower to less than 60 pounds of car weight. Correspondingly the remainder of the sturdy chassis is built strictly in accord with Empire high standard of quality. The body is roomy and lastingly finished; the Turkish seats covered with genuine leather; the equipment complete. All details of construction are revealed in our literature.

This four cylinder car is now ready for delivery, also the Empire High Efficiency Light Six at \$1095.00. Complete details of both these cars, which make up the best line the Empire Company has offered during its six years of continued growth, are being mailed to every dealer in the United States this week. Watch for your copy. Our sales proposition on these two big value, fast selling cars is interesting. We advise immediate correspondence, in regard to the Empire sales plan.

Sedan Top

With both Four and Six cylinder models for 1916 we offer option of detachable sedan top. This new car feature will be in enormous demand by your trade this fall and winter. With this equipment every Empire owner has at small extra cost, practically two cars—a closed type that is comfortable the most inclement weather as well as an open touring car.

The Empire detachable sedan top marks a distinct advance in this construction. It is built for the car and fits perfectly to become a part of the car, but at the same time is easily removed. It is upholstered in handsome and serviceable Bedford cord. Interior light is provided by dome lamp. The sedan top is the big development of the 1916 season. You will be in the best position to meet the demand of your trade most satisfactorily with the Empire line.

EMPIRE AUTOMOBILE CO. INDIANAPOLIS, U.S.A.

With the makers of the
LOCOMOBILE

it is quality not quantity that counts. The makers of
this distinguished car recently adopted

GENUINE
Pantasote

as exclusive top material.

THE TOP IS AN IMPORTANT PART of equipment on your car.
YOU WILL BE EXASPERATED by one that leaks.

YOU WILL BE HUMILIATED by one that spoils the entire appearance of your car.

IT'S ALL UP to the top material.

ALL TOP MATERIALS look good when new.

GENUINE PANTASOTE REMAINS GOOD when old.

Genuine Pantasote

IS TOTALLY DIFFERENT IN COMPOSITION from all other artificial leathers. Remember that.
IT IS PERMANENTLY WATERPOOF—made so by three separate, distinct waterproofing sections.
IT IS REMARKABLY DURABLE and it retains its appearance of newness.
IT IS EASILY CLEANED. The outer surface being smooth, can be cleaned like glass.
IT IS SUITABLE FOR USE IN ANY CLIMATE or temperature from the North Pole to the Equator, on a bone-dry desert, or in the damp air of the seashore.

Genuine Pantasote

WON'T LEAK, CRACK, FADE. Dust, dirt or grease cannot become embedded in it.

A TOP MADE OF PANTASOTE reflects the sincerity of the manufacturer in furnishing the best regardless of first cost.

IT INDICATES that the prevalent serious price and quality cutting has not lowered the quality of his car.

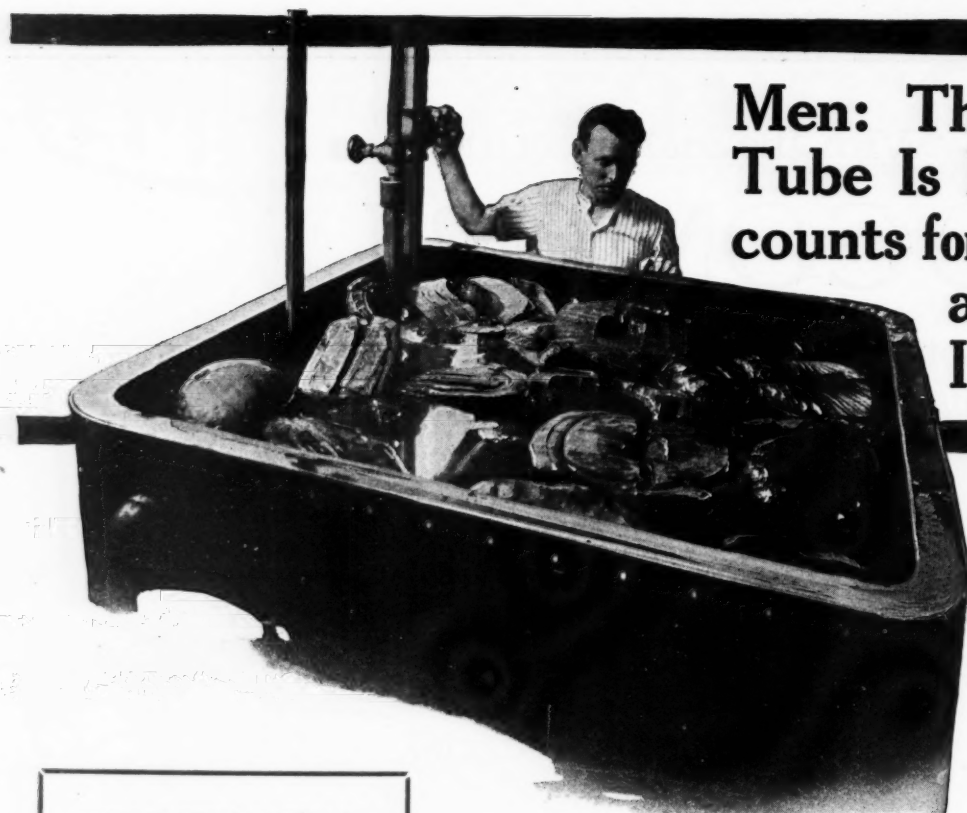
MOST OF THE BETTER CARS are being regularly equipped with tops made of genuine Pantasote.
WHEN YOU SELECT YOUR NEXT CAR demand a top made of genuine Pantasote, and beware of substitutes which increase the dealer's profit at your expense.

"What's What in Top Materials" explains the entire top material question. Your name and address on a postal brings this interesting and informative booklet, free.

The Pantasote Company

1705 Bowling Green Building

NEW YORK CITY



Men: The Stuff This Tube Is Made of Accounts for the Remarkable Service It Renders

Up-River Fine Para Rubber—the finest tube stock obtainable—is used exclusively in building National Special Red Tubes.

We could compound ordinary good rubber for one-third the price we pay for this selected stock. But the result obtained from this finest of all rubber is well worth the added cost.

"SOAKING THE BISCUITS"

The first step necessary to transform raw Up-River Fine Para into National Special Red Tubes is to soak the biscuits of Para in constantly running water. This is done to soften the rubber, so that the biscuits can be cut into small pieces. These pieces will then be fed into the rending and washing machines, where every particle of foreign matter will be removed.

Photograph taken in National Rubber factory.

No other rubber is quite so tough—quite so elastic—quite so enduring as Fine Para—when it is properly treated and cured.

National Special Tubes are made of many *thin* sheets of this fine rubber—not of just one *thick* sheet. And they are made *extra* thick, with the valve base an integral part of the tube — not just pasted on.

National

RED  TUBE

On these hot scorching days you will do well to equip your tires with these tough National Tubes. They are built of the stuff that scoffs at heat, that doesn't slow leak—that won't grow hard and stiff even after a full year's service. You can safely depend upon them to relieve you of most tire troubles.

A few more good dealers wanted for exclusive territories.

Size	Price	Size	Price
28x3	\$3.10	36x4	\$5.90
30x3	3.20	37x4	6.10
30x3 1/2	4.10	34x4 1/2	7.10
31x3 1/2	4.25	35x4 1/2	7.25
32x3 1/2	4.40	36x4 1/2	7.50
34x3 1/2	4.70	37x4 1/2	7.75
36x3 1/2	5.00	35x5	8.50
31x4	5.20	36x5	8.70
32x4	5.30	37x5	9.00
33x4	5.50	39x5	9.50
34x4	5.65	37x5 1/2	10.30
35x4	5.75	38x5 1/2	10.50

National Rubber Company
Factory and Main Offices
Pottstown Pa.



When Writing to Advertisers, Please Mention Motor Age

DEALERS: Now's Your Chance!

Write at once for our Special Dealers' Proposition and Sell Every FORD Owner a *Stewart* Speedometer

YOU have noticed the announcement of the Ford Company that no speedometer will be furnished on Ford cars. This throws the gates wide open for a whirlwind of business for you to sell the Stewart Speedometer for Ford cars.

Every buyer of a Ford car in your vicinity is an immediate customer for you to sell a Stewart Speedometer to.

Thousands of present Ford owners are still operating their cars without a speedometer, because you have not tried to sell them one.

Start right now in making sales of the Stewart Magnetic Type Speedometer to all Ford owners in your vicinity.

Dealers all over the country are jumping at this big opportunity and are already reaping a harvest. Why don't you?

Ford owners want the same type of speedometer as used on all the highest priced cars—the Magnetic Type Stewart. They won't accept anything "just as good." They know the Stewart. They know it is the selection of 95% of all the car manufacturers who equip. Don't offer them anything but the Stewart. It is the easiest to sell and the hardest to compete with. You don't have any trouble to sell a Stewart Speedometer, you only have to offer it to them—it is practically sold the moment you mention "Stewart" to a Ford owner.

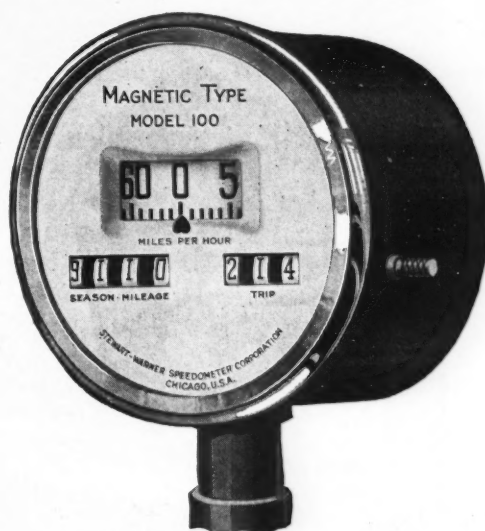
All Stewart Speedometers are fully guaranteed and sold under our liberal 30 DAYS' TRIAL OFFER. TELL EVERY PROSPECTIVE CUSTOMER that if he is not thoroughly satisfied after 30 days' trial, his money will be cheerfully refunded. A more liberal guarantee was never made. And only the finest speedometer manufactured could stand such a liberal guarantee.

**Write Our Nearest Branch
for Special Proposition** They are able to quote you at once on the new trade discounts on this special model.

The Stewart Speedometer, Model 100, has our regular 60-mile speed indicating dial; large figures, easily read; 10,000-mile season record; 100-mile trip record, with a special device for resetting to zero or any tenth of a mile desired, and all without changing the season record; jeweled bearings; case handsomely finished in jet lacquer with brass trimmings to match the Ford car.

Stewart-Warner Speedometer Corporation
Executive Offices: 1931 Diversey Blvd., Chicago
Factories: Chicago and Beloit, U. S. A.

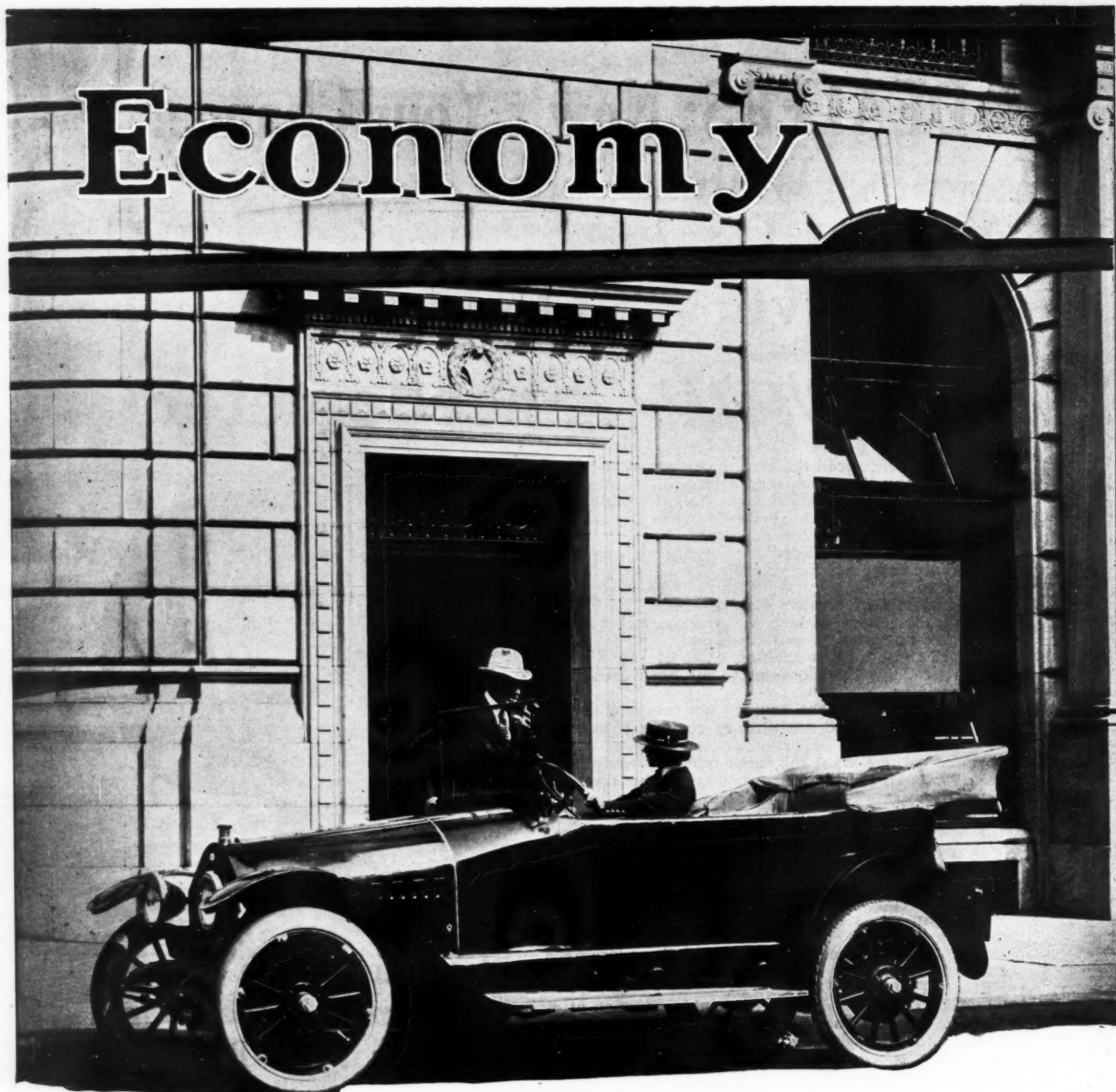
15 Branches—Boston, Buffalo, Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Minneapolis, New York, Philadelphia, St. Louis, San Francisco, London, Paris.
78 Service Stations in All Cities and Large Towns



Complete with special equipment for easily installing it on FORD cars.

\$12

Best opening ever offered to make big, quick, easy profits right—now.

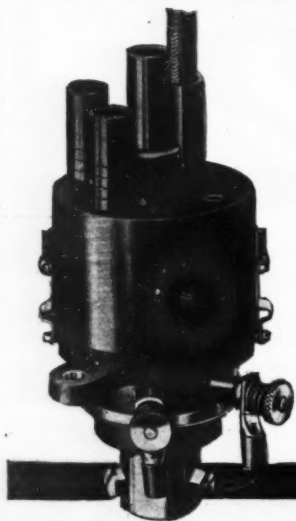


Because of the increase in the range of high gear efficiency which any motor acquires when equipped with

AUTOMATIC · IGNITION CONNECTICUT

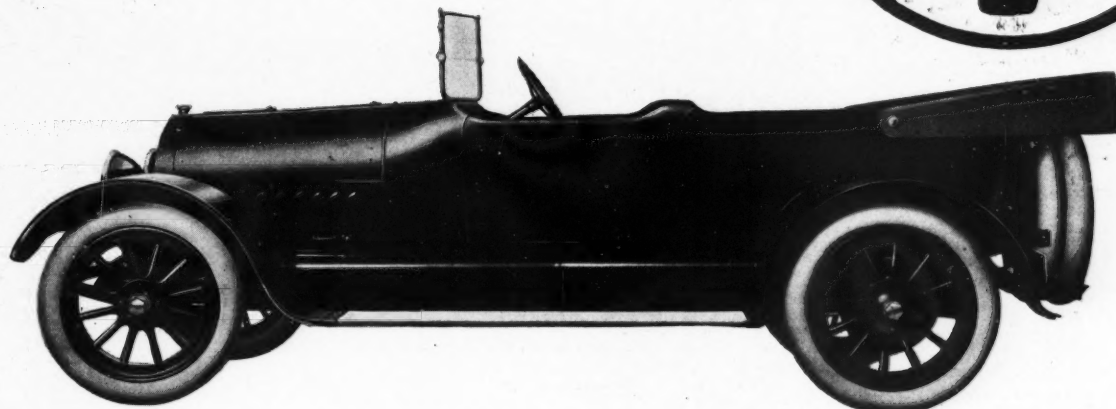
it shows saving in fuel and a decided economy in handling effort as well. Connecticut Automatic Ignition reverses the magneto's performance and delivers its hottest spark at slowest speeds.

CONNECTICUT TELEPHONE & ELECTRIC CO., Inc., Meriden, Conn.



When Writing to Advertisers, Please Mention Motor Age

McFarlan Six



We Are Pleased to Announce the Continuation for another twelve months of Our Series T and X Chassis

A large number of refinements have been incorporated which have resulted in greatly increased power, speed and comfort. These Series will be fitted regularly with Six and Seven passenger touring, Four passenger Submarine or touring roadster body types.

It is needless to say that the equipment includes every convenience known to the motoring public.

The standard colors formerly furnished will be retained for quick shipment. On individual orders, when time is given, personal ideas of the owner as to upholstering and general color scheme, will be followed without additional charge.

We have urged you to avail yourselves of these special privileges.

60 Horse-Power, Series T.....\$2680.00
90 Horse-Power, Series X..... 2990.00

Individual bodies specially designed and built to order by our Custom Body Department

McFarlan Motor Company

Address Desk "A"

Connersville, Ind.



A corner of the Ford plant and a few Ford employees

Ford Owners Are Getting Money Out of a Clear Sky

Apply the Rebate Today to Install a

SPLITDORF-APELCO Electric Starting & Lighting System

which embodies a greater sum of starting-lighting essentials and more features of practical value than any other starting and lighting system ever developed for Ford cars.

It is simple and easy to install the SPLITDORF-APELCO system—and Ford motor repairs can be made without disturbing the installation.

Orders placed AT ONCE will be filled without delay

DEALERS' We have an attractive offering for the handling of **PROPOSITION**
SPLITDORF-APELCO Systems. Write for details.

Splitdorf Electrical Co.

ATLANTA.....10-12 E. Harris St.
BOSTON.....1112 Boylston St.
CHICAGO.....04-72 E. 14th St.
CINCINNATI.....811 Race St.
DALLAS.....402 S. Ervay St.
DETROIT.....972 Woodward Ave.
KANSAS CITY.....1827 Grand Ave.
LOS ANGELES.....1215 S. Hope St.
LONDON

MINNEAPOLIS.....34 S. 8th St.
NEWARK.....290 Halsey St.
NEW YORK.....3-5-7 W. 61st St.
PHILADELPHIA.....210-212 N. 13th St.
PITTSBURGH.....5941 Ellsworth Ave.
SAN FRANCISCO.....1028 Geary St.
SEATTLE.....1628 Broadway
TORONTO.....469 Yonge St.
BUENOS AIRES

Factories: NEWARK, NEW JERSEY

Pacific Coast Price, \$73.00; Canadian Price, \$85.00, f. o. b. Toronto



\$65

Detroit Electric

Doubled output for 1916 reduces prices as low as \$1975

Year after year the Detroit Electric—AN ENCLOSED CAR—has enjoyed greater popularity—has been sold in far larger numbers—than ANY OTHER ENCLOSED CAR of either gasoline or electric type. Yet it has always been recognized as a HIGH PRICED, HIGH QUALITY CAR.

August 12 we reduced the price \$600 to \$725 per car

For 1916 we have lowered the price from \$600 to \$725 per model. We are able to do this not through any change in construction—not by cheapening the quality—but solely because of the many economies gained through DOUBLED PRODUCTION. This season we will build and sell twice as many Detroit Electrics as ever before in the history of the Company and they will be the same HIGH QUALITY cars as our 1915 models plus a score or more of 1916 refinements.

The finest enclosed car on the market

In the 1916 Detroit Electrics you will find—we believe—the top place car of its type—the finest enclosed pleasure car manufactured. We urge you to match it—if you can—in elegance, quality, utility, or value in the entire enclosed car field—gasoline or electric.

Market for Detroit Electrics greatly widened

This marked reduction in price, together with the retention of the high quality standards which

earned for the Detroit Electric its favor among discriminating motor car buyers in past years, simply means a widening of its selling field. Now those who appreciate the many advantages of an electric enclosed car but who have held back because of price consideration will hesitate no longer.

Every town with electricity is a Detroit Electric sales town

Paved streets are not a necessity for the Detroit Electric. Smooth boulevards do not mark the limit of its usefulness. Detroit Electric owners are proving every day that it is just as good for interurban motoring as it is for driving about town. Its great power, big battery capacity and easy riding qualities make your suburban trips as pleasant and comfortable as your spin through the parks.

Here are the 1916 prices

The Model 61 4-pass. Brougham	
(Formerly \$2,600).....	Now \$1975
The Model 60 5-pass. Duplex Drive Brougham	
(Formerly \$3,000).....	Now \$2275
The Model 59 5-pass. Rear Drive Brougham	
(Formerly \$2,950).....	Now \$2225
The Model 57 5-pass. Front Drive Brougham	
(Formerly \$2,950).....	Now \$2250
The Model 57 4-pass. Rear Drive Brougham	
(Formerly \$2,850).....	Now \$2175
The Model 56 3-pass. Cabriolet	
(Formerly \$2,650).....	Now \$2075

You may have either the worm bevel gear or the worm gear; wire or wood wheels, cushion or pneumatic tires, as optional equipment.

A big sales opportunity

The constantly growing demand for Detroit Electrics—the reduction in price—and the doubled output—have rendered it advisable to enter territory which up to the present has not been touched. So to a number of responsible dealers there is now offered the opportunity of selling Detroit Electrics. Last year over a third of all electric cars sold were Detroit Electrics. This year twice that many will be marketed. For information write to

Anderson Electric Car Co.

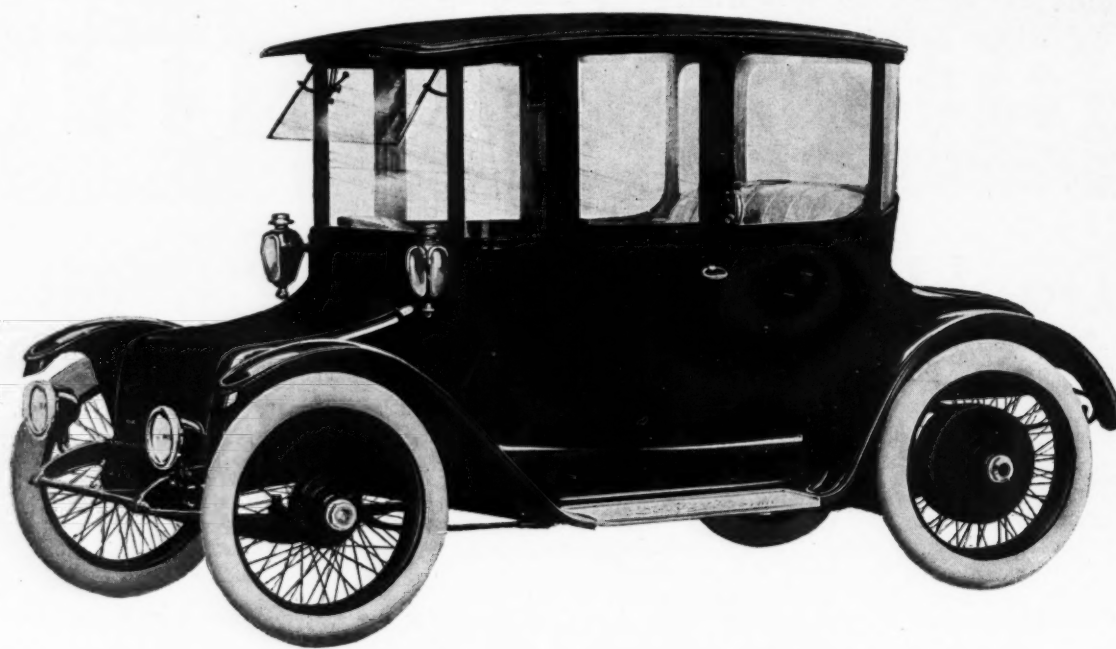
Detroit

Makers of Detroit Electrics

Michigan

World's Largest Builders of Enclosed Pleasure Cars

(38)



HOUK "QUICK CHANGE" WIRE WHEELS STANDARD

Here is the final stamp of approval by a manufacturer of the type of car which combines **beauty, comfort, dignity and efficiency** to the greatest possible degree.

Detroit Electrics were among the first cars to offer wire wheels—first as optional, now as standard equipment. In their endeavors to give the owners of Detroit Electrics a perfect car, equipped both inside and out with the best the market afforded, the Anderson Electric Company year by year got closer and closer to their patrons by equipping their cars with HOUK "QUICK CHANGE" WIRE WHEELS—WITHOUT EXTRA COST.

We are pleased to refer the readers of Motor Age to the Anderson Electric Carriage Company of Detroit, Mich., who have used several hundred sets of HOUK WIRE WHEELS during the past year.

Further announcements of 1916 Automobile Manufacturers who will use HOUK "QUICK CHANGE" WIRE WHEELS as Standard Equipment.

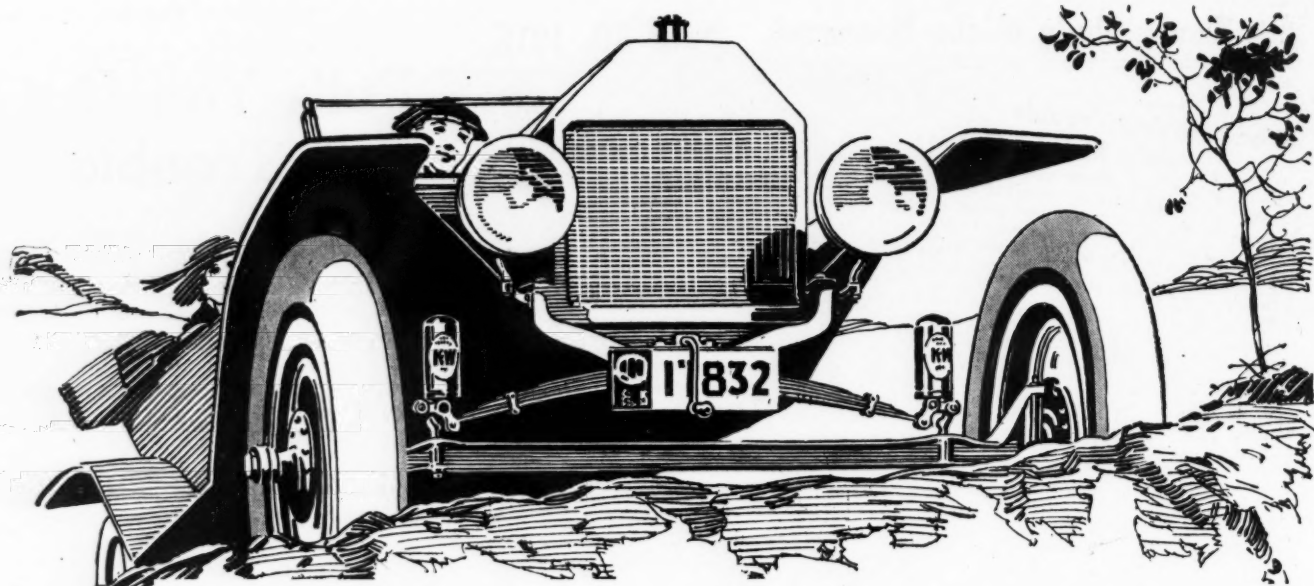
Houk Manufacturing Co.

1701 Elmwood Ave.
Buffalo, N. Y.

San Francisco
Hewes Bldg.

New York
1792 Broadway

Chicago
2337 Michigan Ave.



Enjoy the Scenery—Forget the Bumps

Be a Tourist—Not a Mere Road Inspector

Many motorists today are slaves to the road. Their daily drives and week end trips are limited because of rough, rutty roads. They arrive home tired from being bumped around and "picking the roads"—they see nothing else all day.

Don't be a mere road inspector—equip your light, economical Ford with K-W Road Smoothers and get the greatest enjoyment and comfort.

K-W Road Smoothers give you this enviable comfort because their design combines these four vital factors.

1. A spring to effectively take up the shock.
2. An anti-rebound air chamber to check the rebound.
3. Anti-side motion links to prevent side rocking and swaying.
4. A construction that absolutely does not interfere with the steering.

Each of these features is in itself vital to your comfort and safety. It's only when they are combined in one device that you will get the greatest pleasure from your car. Here's how the K-W Road Smoother fills all these requirements:

The K-W Spring

A helical spring that effectively takes up the shock, made of electric smelted, chrome vanadium steel. The K-W bracket design allows almost **twice the length of spring action** or "travel" (in actual service) of any other.

The K-W Air Chamber

The anti-rebound air chamber with its smooth fitting piston acts like a door check, and gently "eases off" the rebound of the spring. This is an exclusive K-W feature. Its design provides a strong, tough, self-lubricating piston, working in a dust-proof air chamber. It requires no attention.

The K-W Side Motion Links

Made of the highest grade heat-treated drop forgings of remarkable toughness. This enables them to withstand the great strain put upon them. They prevent your car from pitching, swaying or skidding while making sharp turns.

\$15 SET OF FOUR
ONE FOR EACH WHEEL



K-W Bushings

All bearings are phosphor bronze throughout. That means long life. K-W Road Smoothers do not interfere with steering.

But you can find all of these vital factors only in K-W Road Smoothers

That is why they lengthen the life of your car, by eliminating shock and vibration. Tire economy is assured, because K-W Road Smoothers enable the wheels (not the whole body of the car) to follow the contour of the road. That means no grinding off the rubber of the tires. K-W Road Smoothers always make good because they are built with characteristic K-W Quality throughout.

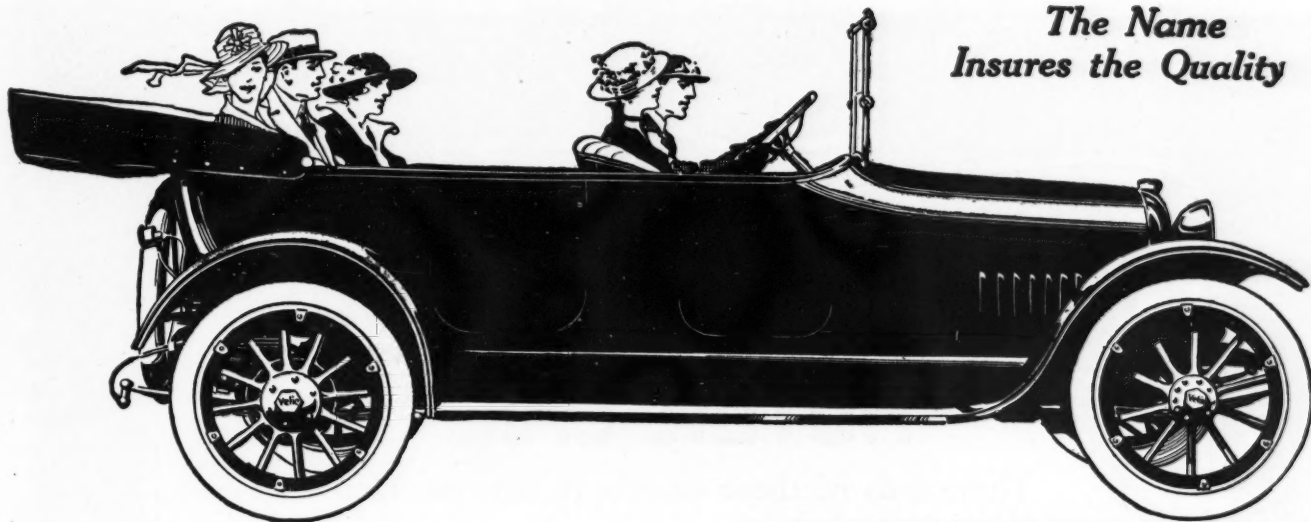
But after all's been said and done, it's results that count; and the K-W guarantee covers not only workmanship and material but **results** as well.

K-W Road Smoothers are quickly and easily attached. No holes to drill and no tools necessary except a wrench. And the final and biggest advantage you get from K-W Road Smoothers is that they increase the radius of your car's usefulness, and bring you home with that "satisfied feeling" after a day of comfortable motoring.

If your dealer can't supply you, sent prepaid upon receipt of price.

Write for Booklet "That Satisfied Feeling"

THE K-W IGNITION CO.
2835
Chester Ave. CLEVELAND, OHIO, U.S.A.
Makers of 125,000 K-W Master Vibrators



*The Name
Insures the Quality*

\$1065

Velie

Six

**A Great Opportunity
for One Dealer in
Every Locality**

WITH Model 22 at \$1065, model 15 five-passenger at \$1400, and model 15 six-passenger at \$1450 we now offer dealers a *complete line* of Velie Biltwel Sixes. On simple comparison any of these cars will outsell any others of its class.

We realize that Model 22 at \$1065 challenges the most exacting judgment. And we welcome it. This low price is the result of more than half a century's experience in the economies on a very large scale.

Judge the remarkable values of this car by such features as these: Velie Continental motor, 40 h. p.; multiple dry disc clutch; automatic ignition system; Hotchkiss type of drive; spiral gears in rear axle; 48-inch underslung rear springs; Velie Stewart vacuum feed; push button starting device; two-unit Remy electric system; Velie mirror finish 20 operations; fine leather deep tufted upholstery; double bulb headlights; 15-gallon tank with gauge at rear; cowl light shows if tail light is going; one-man top; 32x4 tires, non-skids on rear. Complete equipment.

Model 15, our larger car, with 3½x5 long stroke motor, 124-inch wheel base, and every refinement, is now giving remarkable service in the hands of thousands of owners. The low prices above quoted are a reduction of nearly \$200. Demonstrators ready. Ask for folder.

*Your territory may be open—write or wire
for appointment—get our liberal proposition*

Velie Motor Vehicle Company
Moline, Illinois

DODGE BROTHERS MOTOR CAR

Thousands of these cars have now traveled thousands of miles.

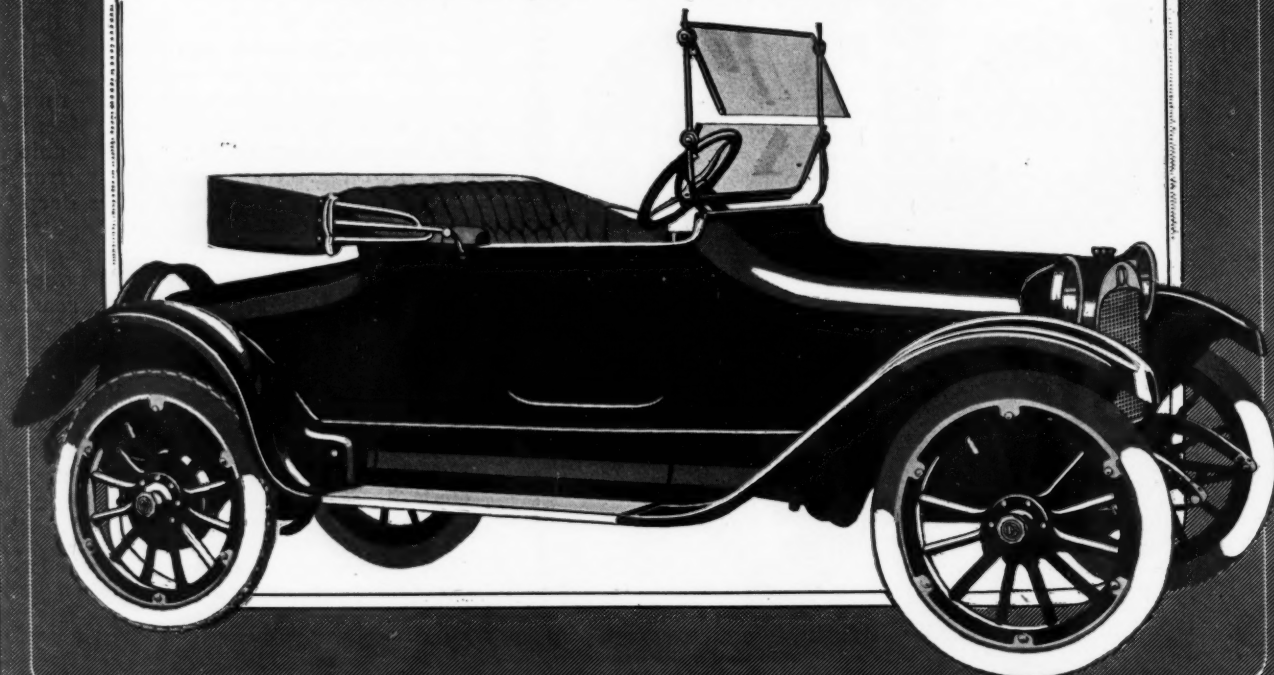
As a result, every dealer has accumulated a mass of interesting and impressive information.

For example, they are constantly receiving reports from owners, of unusual economies in
**gasoline consumption
and tire mileage**

These owners' experiences are so much out of the ordinary, and indicate such a marked saving, that we are sure it will be well worth your while to inquire into them.

The wheelbase is 110 inches
The price of the Touring Car or Roadster
complete is \$785 (f. o. b. Detroit)
Canadian price \$1100 (add freight from Detroit)

DODGE BROTHERS, DETROIT

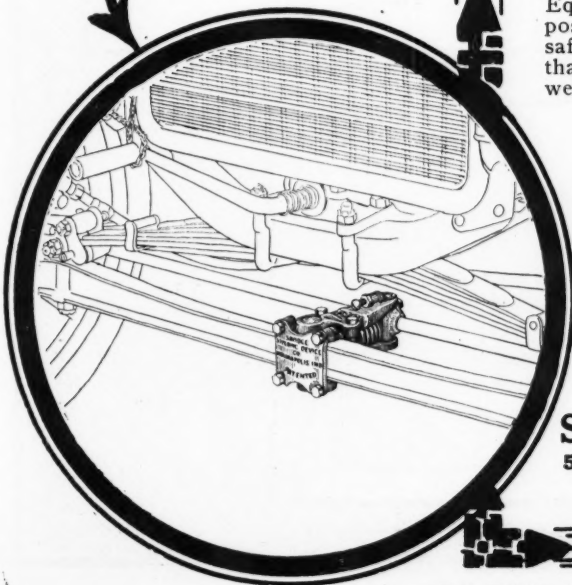


SAVIDGE STEERING DEVICE

Built
Especially
for
FORD OWNERS

\$490

**SIMPLE—
STURDY
SAFE—
SILENT**



Judge the Savidge— by its own Performance

A large number of steering devices recently placed on the market have failed utterly to do what was claimed for them. You, no doubt, have tested one or a number of them and have found them inefficient. Don't judge the Savidge by these failures. Judge it by its own performance—

—Because the Savidge is the only steering device ever made that embodies the variable-cam controlling a heavy coiled spring, giving accurate graduative tension, according to the turning radius.

—Because this variable-cam principle is the only mechanically right construction for a steering device. It is vital and necessary to secure perfect steering control.

—Because the Savidge is the only device that can embody this principle—we control the basic patents.

—Because the largest distributors in the U. S., after competitive test, have picked the Savidge as the only real steering device made.

—Because hundreds of dealers declare that the Savidge is the finest and most inexpensive detail of equipment ever added to Ford cars.

—Because thousands of Fords are equipped with the Savidge—every one has made good.

Increase the Value of Your Ford

Equip it now with a Savidge. Enjoy the perfect, positive steering control, driving comfort and safety that it will positively give you. Better than an accident policy. Protect your person as well as your pocketbook.

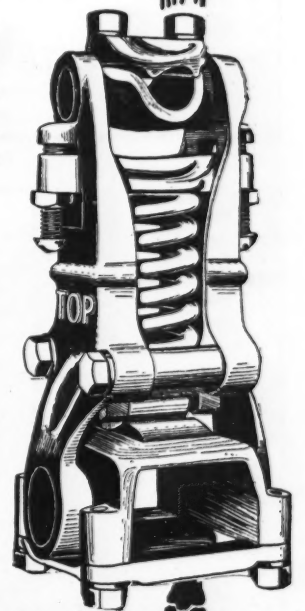
Easy to Attach

The Savidge can be attached by any one in a few minutes. Small wrench only tool needed. Sold under rigid guarantee—you to be the judge. Order Now!

Get Some of the Savidge Profits

Enter into business relation with a firm of strongest financial backing, composed of men who know the automobile accessory industry—and are in business to stay. Write for our liberal selling plan.

Savidge Steering Device Co.
502 Murphy Bldg. Indianapolis, Ind.



RAYFIELD

CARBURETORS

First Choice In Carburetors

IF all well-informed users and garage men were to vote for the most popular carburetor, the Rayfield would unquestionably stand first.

Wherever you go, people admire the Rayfield.

They like its famous "kick," or acceleration. They want the economy, power and speed it gives them.

What experts know about the Rayfield you will understand the first time you try one. You will have "more car." The Rayfield is higher priced, but if you ever use one the difference in price couldn't buy it back.

The Rayfield will fit your car—Send for Catalog

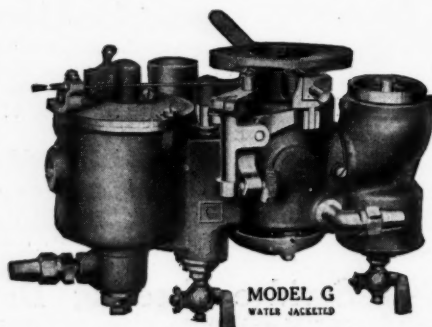
Findeisen & Kropf Mfg. Company

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**1140 Michigan Avenue,
Chicago, Ill.**

**1902 Broadway,
New York, N. Y.**

**1214 Woodward Avenue,
Detroit, Mich.**



MODEL G
WATER JACKETED



Why the Eight?

Americans are most exacting where their comfort, ease and convenience are involved.

They ruthlessly relinquish yesterday's perfections for today's improvements.

They were content to ride in the first crude cars only so long as nothing better was obtainable.

They stopped cranking cars by hand as soon as the self-starter was perfected.

Thousands of pleasure and ease-loving people will be captivated by the magnificent Regal Eight, once you have taken them for a spin.

They will never be able to withstand the smoothness of its remarkable engine. The absence of lapse in impulses—the freedom from jerks and jars—the omission of labor in "picking up" and the feeling of unlimited reserve energy. The faint hum of the motor arouses intense enthusiasm, as they seem to ride along on air. They mentally exclaim—"How can such a car be produced for \$1200."

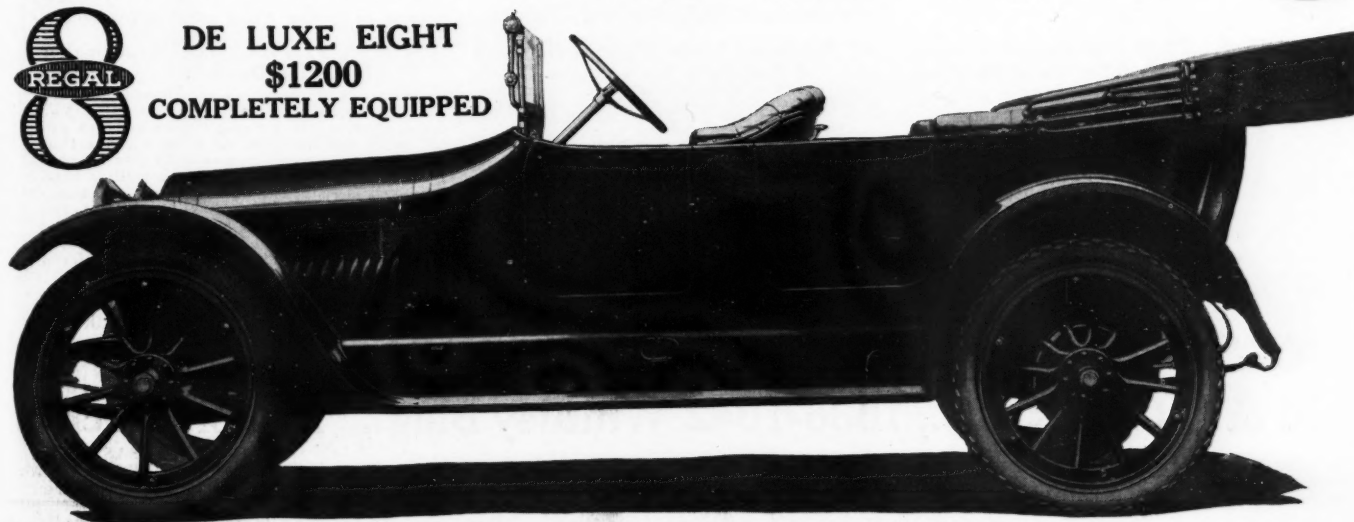
This Regal Eight marks the highest development of Regal efficiency—a car that shows in every line—every refinement—every detail, the sturdiness, power and dependability, which, for more than eight years has characterized the product of the Regal factory.

All three Regals, the Light Four at \$650, The Standard Four at \$985, and this DeLuxe Eight at \$1,200 have the same handsome, roomy, streamline bodies and complete equipment, including electric starting and lighting, one-man top, demountable rims and speedometer.

The Regal Motor Car Company

401 Piquette Avenue, Detroit, Michigan

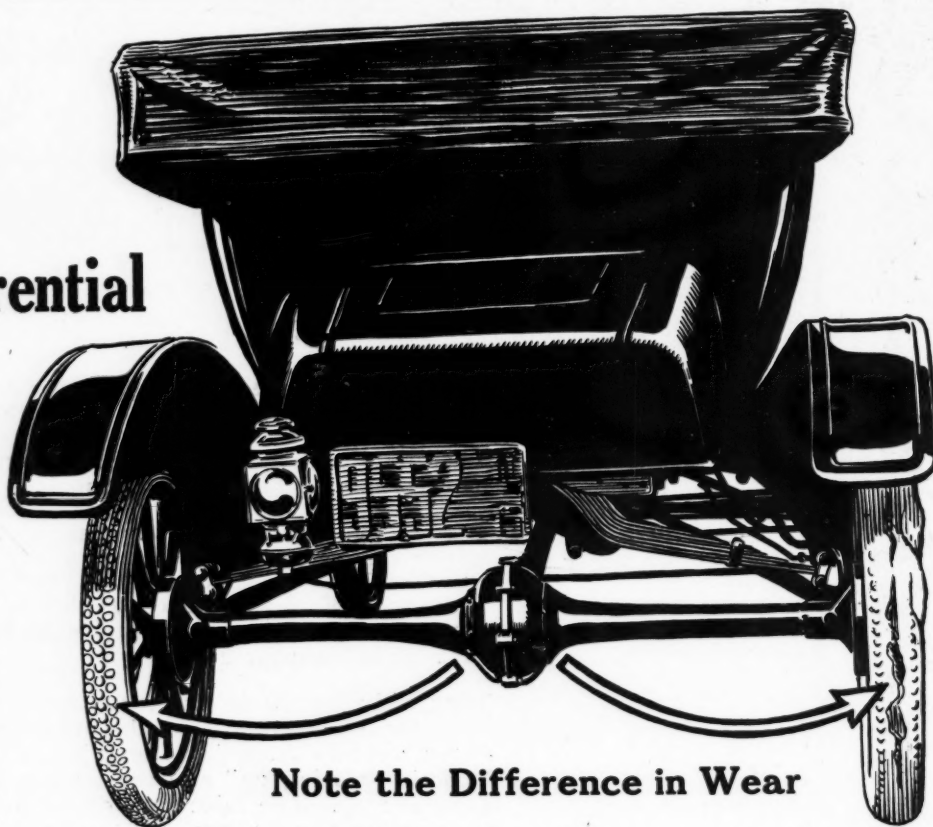
**DE LUXE EIGHT
\$1200
COMPLETELY EQUIPPED**



The Only Way to stop the extra wear on the right rear tire is to use the **M & S Differential**

Look at the right rear wheel of your Ford. Notice the great wear on that tire as against the other rear wheel. It's due to "wheel spinning" and the reason is that the ordinary differential does not equalize the pull on both rear wheels. The right wheel spins the most because when the weight is on the left hand side (as

is the case when driving without passengers) the left wheel has greater traction and the ordinary differential carries the power to the wheel having the least traction. The M. & S. Differential does exactly opposite—it carries the power to the wheel having the greatest traction, assures a positive pull and does away altogether with wheel spinning.



Note the Difference in Wear



Special Type for Ford Cars

The M & S is standard equipment on the Jeffery "Quad"

designed to fit into the Ford differential housing, using the same pinion and bevel driving gears. Any mechanic can install it in a few hours. M. & S. Differentials are made by Brown-Lipe-Chapin Co.

The M. & S. Marks the Biggest Advance in Automobile Building Since the Electric Starter.

The M. & S. Differential insures a positive and equal pull on both wheels at all times. If one wheel has traction and the other does not, the wheel without traction can revolve no faster than the one with traction. In other words, the M. & S. is really an automatic differential lock which operates when a lock is necessary, yet differentiates wheel traveling in turning corners.

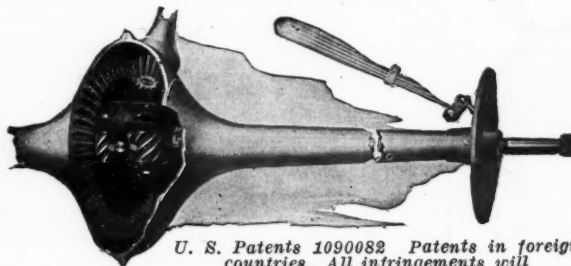
To Ford Dealers---

We want every Ford Dealer to install an M. & S. Differential in a Ford Car and then drive it in sand and mud and over slippery pavements. To Ford Dealers we make a liberal offer on a sample Differential for your Ford.

To any one financially able to handle large territory in a big money-making way, we have an exclusive proposition. It will pay you to investigate.

M & S GEAR CO., 1036-1042 Whitney Bldg., Detroit, Mich.

DISTRIBUTORS: M. & S. Sales Co., 429 So. Ervay St., Dallas, Texas; M. & S. Sales Co., S. E. Cor. Race & Broad St., Philadelphia, Pa.; Hill-Smith Metal Goods Co., 88 Pearl St., Boston, Mass.; M. & S. Sales Co., 936 Woodward Ave., Detroit, Mich.



U. S. Patents 1090082 Patents in foreign countries. All infringements will be prosecuted.

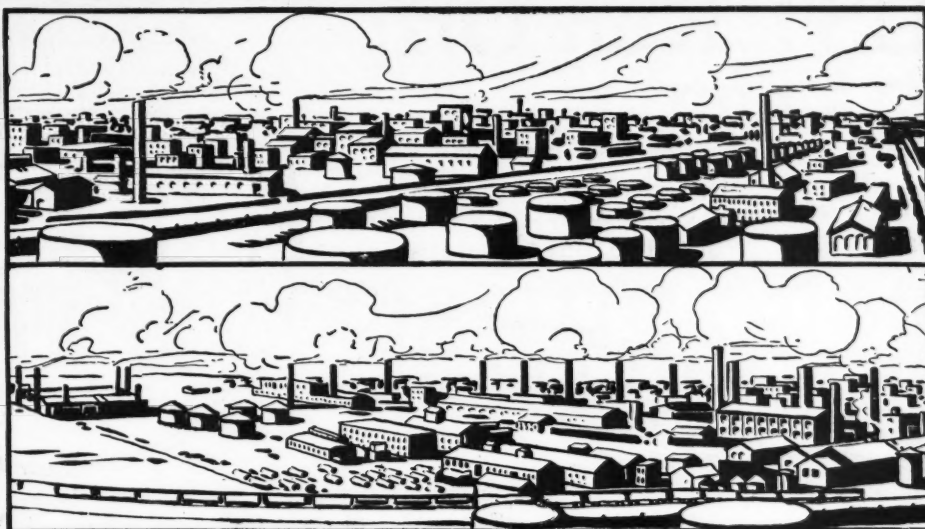
"Pulls Both Wheels"

All the Power in the World Is No Good if You Have No Traction.

The M. & S. enables you to get out of any mud holes, sand or snow if one wheel has even the slightest traction. By insuring this positive and equal pull on both wheels, you save anywhere from 500 to 1000 miles' wear on the rear tires. You get more mileage to the gallon of fuel and you utilize all your engine power for work and not for idle spinning. The M. & S. transmits the power to the wheel or wheels having traction at all times, thereby minimizing the danger of wheel skidding and lessening the possibility of serious accidents due to loss of traction by the rear wheels.

The M. & S. Is a Certain Moneymaker for Dealers.

Every Ford owner is a prospect. Every demonstration practically means a sale. You have no competition and it's so easy to sell M. & S. Differentials to Ford owners that you can make more money with less expense and effort than you can make selling cars. The cost is only a trifle more than the regular Ford Bevel Gear Differential, yet the advantages of the M. & S. are so obvious that no Ford owner will be satisfied with his present differential when once he has driven a Ford equipped with an M. & S.



The Great Standard Oil Company Plant at Whiting, Ind.

Where Science Produces the *Scientific Lubricant* for Motor Cars

Here, in this modern plant, is every known facility for the perfection of motor oil.

Here are expert mechanics who within the past twenty years have studied every standard make and type of motor car produced.

Here is a staff of eminent chemists constantly working to improve

Polarine. The result is, this oil has reached the limit of today's possibilities.

Better oil can't be made until new methods are found to improve on those we use. No expense is too great—no care too extreme—if we can better Polarine even a trifle.

Polarine
FRICTION REDUCING MOTOR OIL

There is need for such oil in *your* motor. For good oil not only means maximum power but prolongs the life of the motor and cuts down expense.

Insist on getting Polarine—accept no substitutes.

It costs no more per gallon to buy than some oils not half as good.

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(INDIANA)
CHICAGO, U. S. A.

Also producers of Red Crown Gasoline—the scientific fuel

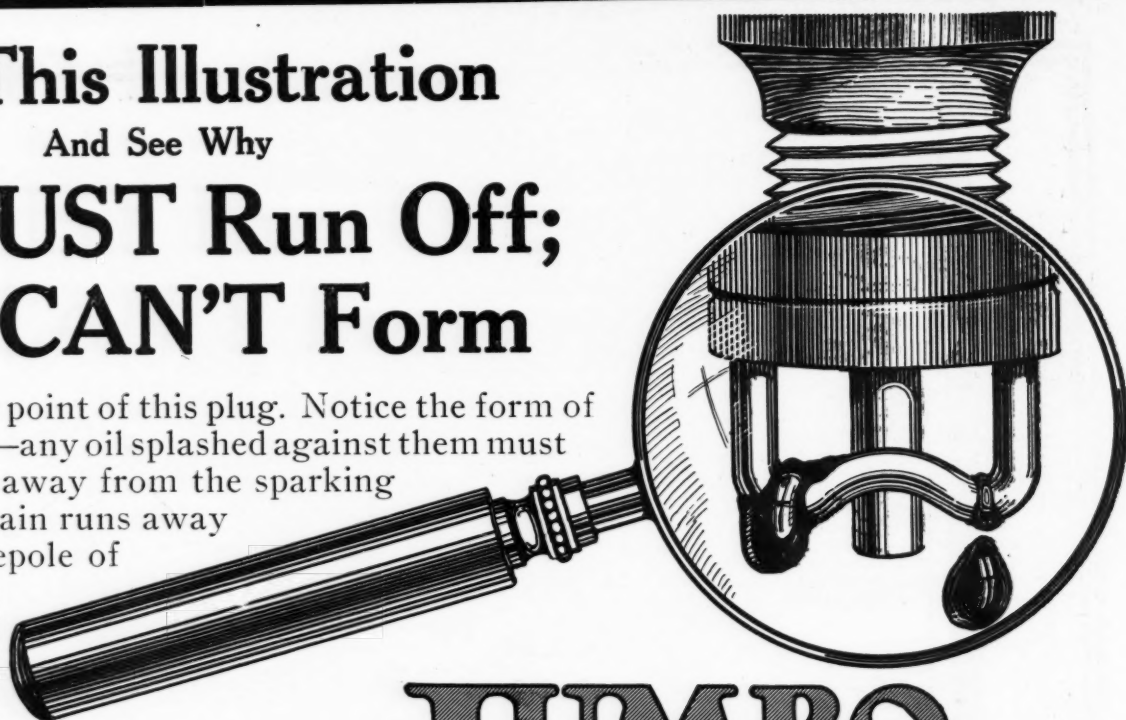
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Study This Illustration


And See Why

Oil MUST Run Off; Soot CAN'T Form

at the sparking point of this plug. Notice the form of the electrodes—any oil splashed against them must run down and away from the sparking point, just as rain runs away from the ridgepole of a house. This is only one of many unusual features that make



JUMBO



SPARK PLUGS



the best buy in the spark plug market. The big, massive insulator will **not** crack with the heat. A liberally proportioned copper-asbestos washer prevents compression leakage, and protects the porcelain insulator from the hammer-like blows of explosion.

No matter what terminals are on the cables in the car, Jumbo Giant will fit them, because it has a

Universal Terminal

which gives perfect electrical contact with plain, Q-D or slip terminals. This means that the dealer needs to carry in stock only a third as many plugs to meet all requirements.

When you put a set of Jumbo Giants on your car, your plug troubles are taken care of for fifty-two weeks, for

Every Jumbo Giant is Guaranteed For a Year

This means precisely what it says—if, at any time within one year of

purchase, a Jumbo Giant develops any defect, or in any way falls down on the job, you can get a new one without further cost. Just send the defective plug back to us, with the guarantee coupon issued at time of purchase, and we will see that you're supplied with a new plug.

Test Jumbo Giant For Yourself

If you are a dealer, write us on your own letterhead, and we will send you a plug for trial. Test out under the most severe conditions you can think of. If it doesn't fully prove its absolute superiority over every other plug made in America, we won't expect your future business.

Our discounts will interest you—write for them

Gibson-Hollister Mfg. Co.

3380 Washington Street

Jamaica Plain, Mass.

69-6



The spring with
no center bolt

The spring with
no center bolt

Absolute safety at any speed
over any road

Tuthill Titanic Springs

Guaranteed forever against center breakage

Carry a "Spare" Spring

Dealers—write to your nearest Tuthill distributor

Albany	-	Albany Hardware & Iron Co.
Atlanta	-	- Elyea-Austell Co.
Baltimore	-	Baltimore Hub Wheel & Mfg. Co.
Boston	-	- Post & Lester Co.
Buffalo	-	- H. D. Taylor Co.
Chicago	-	- All Jobbers
Cincinnati	-	- The Ohio Rubber Co.
Columbus	-	- Griswold-Sohl Co.
Dallas	-	- Fisk Co. of Texas
Davenport	-	- Sieg Iron Company
Dayton	-	- S. T. & G. A. Gebhart
Denver	-	- Auto Equipment Co.
El Paso	-	Western Motor Supply Co.
Indianapolis	-	- W. J. Holiday Co.
Kansas City	-	- The Faeth Iron Co.
Lincoln	-	- Nebraska-Buick Auto Co.
Los Angeles	-	- Chanslor & Lyon Co.
Milwaukee	-	- Babcock Auto Spring Co.
Minneapolis	-	- Western Motor Supply Co.
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St. Louis	-	- Auto Devices Co.
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Carrying a "spare" tire or spring is not a fad—its a safeguard against annoying delays and inconvenience when touring.

When you order your new car—or in replacing broken springs—its to your interest to insist upon and see that you get Tuthill Titans, especially when they cost no more than the ordinary breakable kind.

A Tuthill patent device takes the place of the weakening center bolt—insuring a more resilient, longer lasting and an absolutely satisfactory spring that will outlast your car.

No matter where you may happen to be, its easy to get a Tuthill Titanic—dealers everywhere carry them in stock or they can get them from us or the nearest Tuthill distributor on a minute's notice.

There's a Tuthill Titanic for any car, including yours.

Tuthill Titanic's also furnished with Dann Insert—the Inter-Leaf Shock Absorber—if desired.

TUTHILL SPRING COMPANY

772 Polk Street, Chicago, U. S. A.



*Tuthill Titans are guaranteed
forever against center
breakage.*

*Tuthill "Titans" can be easily adapted
to any axle construction and quickly
mounted without any extra expense.*

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of

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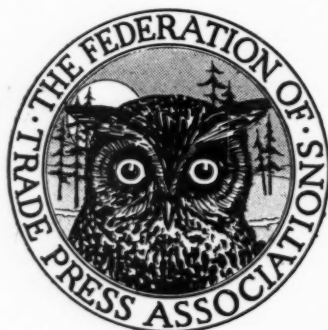
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Here's Some of the Reasons

Examine this dissected-tire illustration—from "life." Note the seven plies of Sea Island Cotton duck; the thick cushion; the strong breaker strip; the special binder strip and the thick, tough tread of white rubber.

These materials, the finest used in tire making, are built in by hand—slowly and with the greatest care by expert tire makers. Then, we use the modern wrapped tread, single cure process.

TRADE MARK
 **QUAKER**
 REG. U.S. PAT. OFF.
 Tempered Rubber
TIRES

If we stopped right there and simply gave QUAKER TIRES the ordinary cure, they would be the equal of any. But we do not, for QUAKER TIRE rubber is specially prepared by our secret formula to give it TEMPER.

Besides imparting the extra necessary degree of toughness, resiliency and tensile strength to the rubber, our exclusive method of TEMPERING QUAKER TIRES preserves the vitality of every strand of the duck.

This is why many users are getting 8,000, 10,000, 12,000 and up to 20,000 miles out of QUAKER Tempered Rubber TIRES.

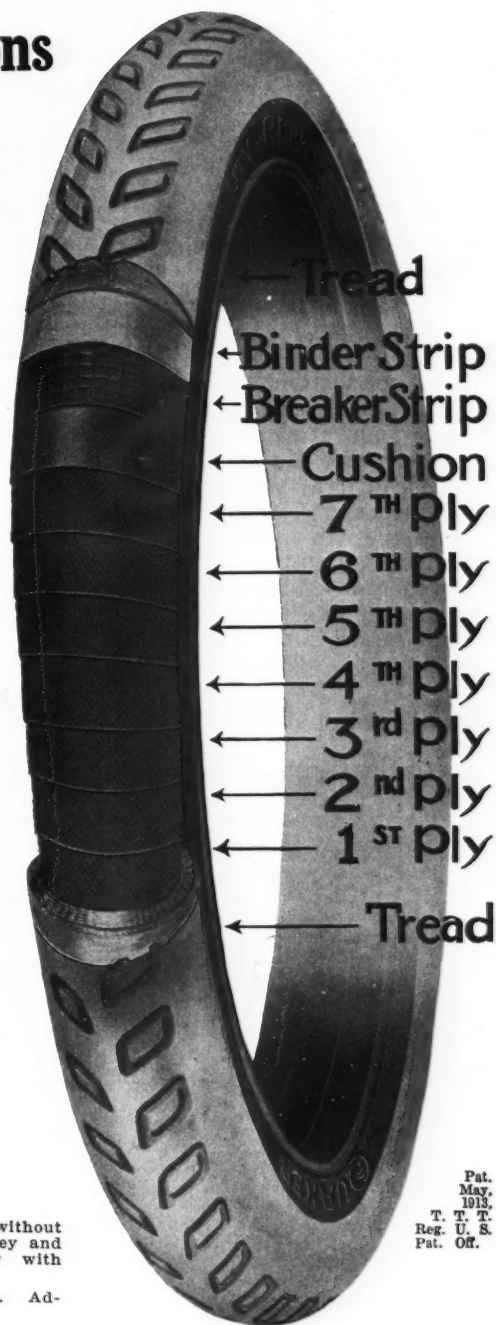
Dealer Investigate

QUAKER TIRES are easy to sell, especially on "repeat orders." Our "Square-Deal" policy, national publicity, and concentrated direct advertising to buyers in your territory will make money for you fast. Address Mr. Moore.

Tire Buyer Economize

Get full or excess mileage without "adjustment" bother; save money and time by equipping your car with QUAKER TIRES.

Write for users' testimonials. Address Mr. Lyons.



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May,
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T. T. T.
Reg. U. S.
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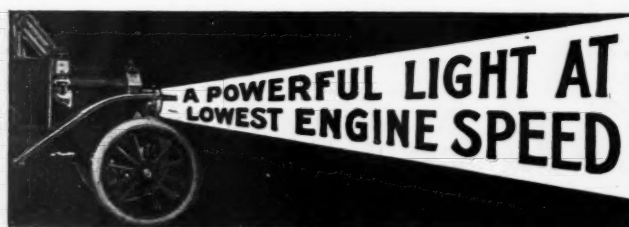
QUAKER CITY RUBBER COMPANY

Factory and Home Office, PHILADELPHIA

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182 West Lake Street

PITTSBURGH
211 Wood Street

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207 Fulton Street



AT LAST WHAT YOU HAVE LONG WAITED FOR

The New York Automatic Headlight Controller For Ford Cars. Price \$5.00

The Most Welcome Invention of the Age

Delivers a powerful light at the lowest engine speed. Uses the regular Ford magneto, requiring no batteries or complications. Entirely automatic in its operation—no belts, gears, or movable connections to the engine are employed. It also prevents the bulbs from becoming burned out at excessive engine speed. This is positively the first and only solution to the electric head light problem on Ford cars. We furnish necessary wires already connected so that any one can install in ten minutes by the simple removal and replacing of one bolt.

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Install a New York Master Vibrator on Your Ford Car

And enjoy the smooth, evenly applied power so noticeable in six cylinder engines

Price \$8.00 at your dealer



It is immaterial if your car is the latest or oldest model.—You need our master vibrator, as it dispenses with all coil adjustments and replacements, and insures easy starting, a hot perfectly timed spark under all conditions, and entire freedom from ignition troubles. It has for the past six years proven itself to be superior to any existing type. Though many times imitated it has never been equalled and stands today the best in its class at any price.

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WESTERN BRANCH, 1461 Michigan Ave., Chicago, Ill.

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Any trouble you can think of—can instantly be located by turning to the index, then to the Digest of Troubles, which will give the cause and the remedy.

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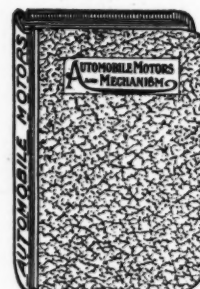
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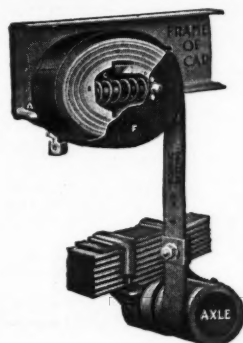
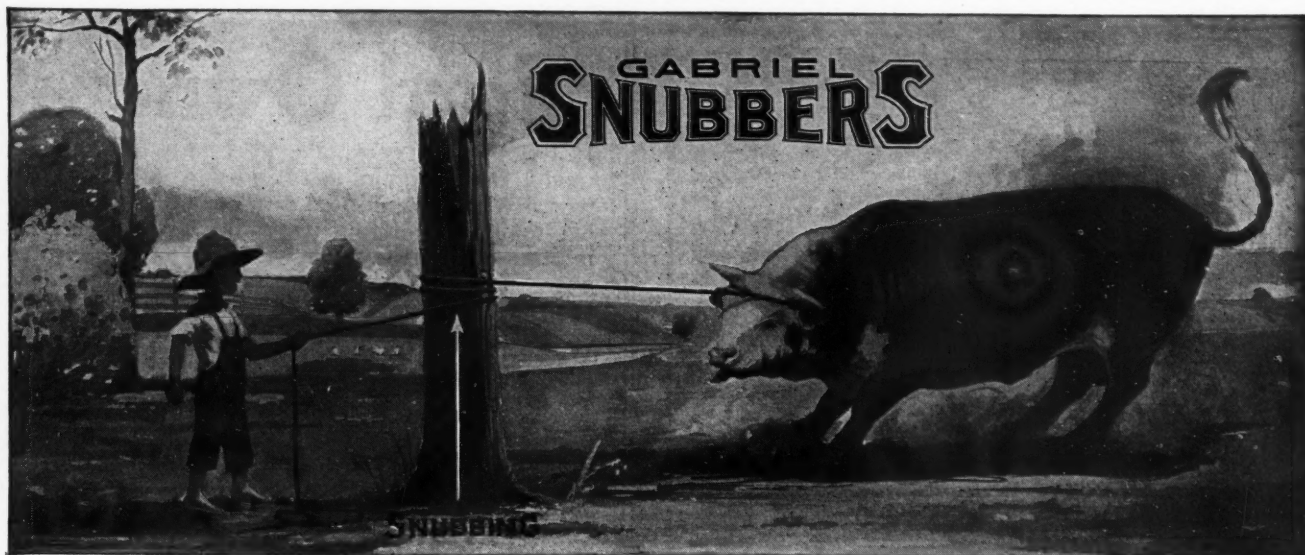
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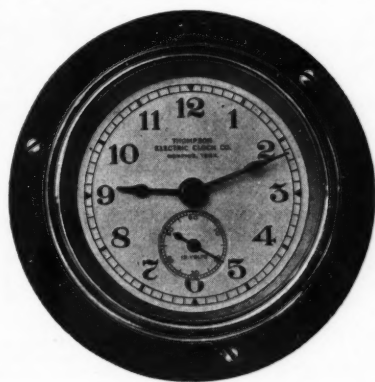
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\$12

Stop Winding Your Auto Clock It Won't Run Down if It's Electric

Don't waste your valuable time during the day
setting the old clock hours ahead from the point
where it stopped last night.

Carry the right time in your car always, without winding or
setting a clock. Get a—

Thompson Self-Winding Electric Clock

—An ornament on the cowl board of any car. A handy convenience for
women drivers.

Absolutely guaranteed to keep accurate time in all kinds of weather and
under all conditions. Unaffected by vibration and rattle. Water- and
dust-proof. Seth-Thomas Clock Co. movement. Winds itself auto-
matically. Operates on storage batteries or dry cells. Draws little
current. Prolongs life of batteries and prevents deterioration from
non-use. Simple to install. Complete instructions with every clock. Price..... **\$12**

Write for free illustrated folder, and letters from users.

Thompson Electric Clock Company
Memphis, Tennessee



The Staude attaches to any make of automobile. The pure amber glass protects the eyes of the driver from all bright and glaring lights.

THE STAUDE GLARE STOPPER

The Staude Glare Stopper is one of the fastest selling motor accessories of the year. It solves the headlight problem from the right end.

Every driver needs all the light he can get on the road.

RETAIL PRICE

\$2.50

The Staude protects the driver's eyes from blinding headlights, yet in no way impairs the view of the road. It dissects the light rays and eliminates the glare.

The beautiful, rich, amber colored glass, 6 1/2 inches in diameter, looks fine and lends tone to any car.

The Staude is not "tinny" looking, and you know amber colored glass will not fade or curl like celluloid.

Most up-to-date dealers carry the Staude Glare Stopper, or we will send you one parcel post C. O. D.

The Staude is sold with a lasting absolute guarantee. If you are not delighted with the Staude and convinced after using it that it is indispensable to you, return it and your money will be refunded.

DEALERS

Our quantity discounts for jobbers and dealers allow you a good margin of profit. The Staude means quick turnovers.

Write us.

E. G. Staude Manufacturing Co.
2675 University Avenue St. Paul, Minn.

Dear Sirs:

Please send me by Parcel Post, C. O. D. \$2.50 prepaid, one complete

STAUDE GLARE STOPPER

with the understanding that I may return it, if unsatisfactory, and get my money back.

Make of car.....

Name

Address

City..... State.....

Ford Owners

Now is the time to put a 1915 body on your old model Ford car, and sell it quick at a price that's worth while. A limited number of Ford Columbia roadster and touring bodies are selling this month—while they last—at the lowest figures ever quoted. Make some money getting rid of the old car.

Roadster Bodies—1915, with Top,
Curtains, Cowl Dash.....\$35.00 each
1915 windshields 6.90 each
1915 two side and tail lights... 4.50 set
1915 rear curved fenders..... 4.50 set

Complete, ready to assemble... **\$50.90**

Touring Car Bodies—1915, with Top,
Curtains and Dust Hood.....\$75.00
1915 windshields 6.90
1915 two side and tail lights... 4.50
1915 rear curved fenders..... 4.50

Complete **\$90.90**

Crated and delivered to depot free. Order must be accompanied by check equal to 1/4 purchase price. Balance on receipt of bill of lading. 2% discount for cash in full in advance.

Speedster Bodies



Or if you are going to keep your Ford turn it into a snappy speedster, with style and class. Bucket seats, 2 oil tanks, tool box built in back, full

set of fenders, splash guards, running boards..... **\$82.20**

Terms of payment as above.

Columbia Rear Fenders for Delivery Bodies

Made to our own specifications to stand the strain of hard usage. Write for specifications. No charge. Worth money to you.



\$6.10

Skeleton Dash

—with 1915 dash where interchange of commercial bodies is desired, \$1.50. Regular 1914 Ford 3-ply dash, mahogany, brass trimmed, guaranteed not to warp, \$2.



Hood Ledge

Above is cut of our Skeleton Dash to be used in connection with 1915 dash where interchange of bodies are desired. Finished in black only; price \$1.50 f. o. b. Detroit. Regular 1914 Ford Dash—our 3-ply dash, finished in mahogany, brass trimmed, guaranteed not to warp. Price \$2.00 f. o. b. Detroit.

Ford price \$1.00—our price 60 cents. Regular Ford hood ledge for commercial bodies fits any Ford model.

Bucket Seats

—ready to bolt down and paint. Pair..... **\$5.50**
Neatly upholstered, 2 backs, 2 spring cushions, \$15.



1914 Windshield

—for commercial bodies. 6 in a crate. Can ship on receipt of order. Each..... **\$6.90**



Write for Illustrated Catalog—Free

Columbia Body Co.
Detroit Michigan, U. S. A.

You can install this Manzel Ford Pump yourself—and in a very short time.



Its construction is right—it will outlast your motor.

INVEST YOUR FORD DIVIDEND

There is no way in which a Ford owner can invest his Ford dividend to better advantage than in equipment that will improve the enjoyability of his car. And there is no other piece of equipment that can add to his enjoyment, increase his comfort, lighten his labors and at the same time return cash dividends in tire saving in the same degree as a

MANZEL FORD TIRE PUMP

Take this broad, strong statement at its face value, Mr. Ford Owner; go to your dealer; look over this sturdy businesslike pump; investigate the reputation of the Manzel organization that stands behind it; take it on trial for 30 days.

All we need is a hot day and a flat tire, you on the road, miles away from "free" air. You attach your hose to a pump and tire, start your engine, and presto! in a few short moments your tire is up to its best pressure, your hose away, hood down, your hand on the wheel, and away without soiling your clothes or your hands. It was not so before!

One such incident, and you're a dyed-in-the-wool roofer for a Manzel Ford. How much? It's a Ford price—

\$7.50 Complete with gauge, gears and 12 feet of air hose **\$7.50**

Your dealer has it—if he's a live one. If not, ask us.

MANZEL BROS. CO.

Factory and General Sales Offices

306 Babcock Street, Buffalo, N. Y.

New York Office—U. S. Rubber Bldg., Broadway & 58th St.
Portland, Oregon, Office—213 Gerlinger Building.

San Francisco Office—356 Market St.

DISTRIBUTORS IN ALL IMPORTANT CENTERS

THE MANZEL 2-CYLINDER PUMP FOR LARGER CARS is the finest tire pump in the field—with no exceptions. Wise motorists have proved we are right by buying thousands of them. Its price is low enough to be within the reach of every man who wants comfort at a reasonable price.

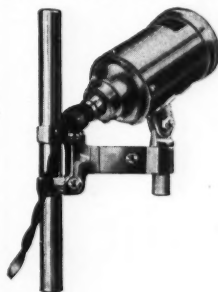
\$20 COMPLETE WITH ALL FITTINGS

PITTSBURGH DIRIGIBLE SEARCHLIGHT

You know the headlight's limitations. The Pittsburgh Dirigible Searchlight has no limitations.

Gives the driver a powerful beam of light wherever he needs it, front, rear, side, up, down.

Needed every night for backing, turning, reading signs, for lighting sharp curves and dangerous places, for locating trouble and seeing beyond the range of the headlight.



A Small, Neat, Compact Lamp in Full Nickel Finish that Looks Good on the Windshield.

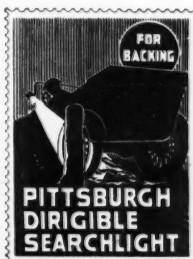
Powerful, accurately ground lenses. The most powerful small lamp made for windshield mounting. Searchlight, auxiliary headlight, trouble lamp all in one.

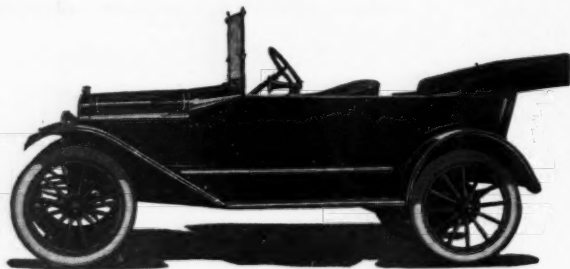
Price \$8.00

One of the Season's Best Sellers

Live dealers and agents everywhere find a big demand for the Pittsburgh Dirigible. If you haven't a supply, write today. Refer to Catalog No. 3600.

Pittsburgh Electric Specialties Co., Pittsburgh, Pa.





METZ "25"

The Quality Car

The man who is looking for a strictly first-class car with complete, up-to-date equipment, knows he has found what he wants when you show him this new Metz Touring Model, and tell him the price—

\$600

Including Electric Starter and Electric Lights as Regular Equipment

Electric starter and electric lights, rain-vision, built-in windshield, instant one-man top, heavy tufted upholstery, deep cushions, 32-inch wheels, 3½-inch Goodrich clincher tires, Hyatt roller bearings, built-in gasoline gauge, speedometer, signal horn, tools, etc.

We want to hear from Dealers

Write for particulars and New Catalog "K"

METZ COMPANY, Waltham, Mass.



Bull Dog Quality

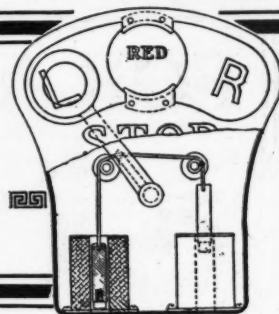
Represents the difference between superiority in rubberized fabrics and the ordinary kind. When you want waterproof trimmings of quality, order Bull Dog.

Bull Dog Quality is made in double and single texture of Mohairs, Serges, and other attractive fabrics, rubberized together in a manner that has made Bull Dog Quality famous for waterproof trimmings for Automobile Tops, Curtains and Upholstery. Send for Samples.

L. J. MUTTY COMPANY
BOSTON, MASS.

Pomeroy's Automobile Rear Signal Indicator

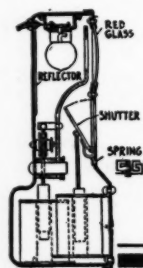
Automatically Controlled by
the Steering Wheel



Don't blame the man behind if he smashes your car. He can't tell what you are going to do at night.

The POMEROY Rear Signal Indicator will automatically tell him your anticipated movements all the time. It registers right and left, it carries the legal tail light which is always kept burning, holds the number plate and has in addition, a button on the steering wheel by which you may flash the word "STOP"!

**Price \$12.00
complete**



Patents Pending

If you value safety and comfortable travel at night, as well as the car you drive, you need this handsome, durable, automatic and invaluable Indicator.

Ask us for further information.

B. H. POMEROY, M. E.

10 Jones Ave., ROCHESTER, N. Y.

Scripps-Booth Luxurious Light Cars

Deliveries NOW

Never before have such luxury and beauty been offered in a light car. Demonstration proves that there is no greater riding comfort or more satisfactory performance in any car at any price.

Now in the sales rooms.

SCRIPPS - BOOTH COMPANY
DETROIT, MICHIGAN



The Late Revised Edition at Least 100 Per Cent Better

**Enlarged—Revised Edition
Now Ready**

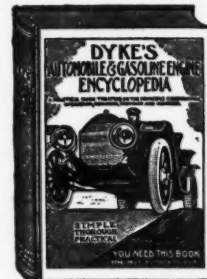
Some of the New Subjects Added

Ford Instruction, Trucks, Tractors, Electric Starters, Generators and Lighting Systems—up to date. Six Eight and Twelve Cylinder Engines. Repairing subject greatly improved. 1750 illustrations instead of 1200. 640 pages instead of 596. 49 instructions instead of 40. Entirely revised.

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Class Journal Company

910 So. Michigan Ave. Chicago, Ill.



A teacher, guide and reference on everything pertaining to motoring. Simple as the A B C's. Worth its cost if only placed on the shelf and used as a reference.
Price\$3.00

FOR TOURING

FOSTER OWL LIGHT

Only searchlight obtainable with FOSTER patented universal swivel. Throws a powerful spotlight in any direction. Makes strange roads safe. Locates dangerous turns. Shows how close you are to the edge of the road. Prevents collision with unlighted horse-drawn vehicles. Looks around corners and follows winding curves.

Enables you to read road signs and street names. Spots, forks, turns and

landmarks long before you get to them—enabling you to follow Blue Book routes without slowing up. Cuts through night fog like a knife. Shines like a locomotive headlight up the road.

Write for
Free Booklet

Operates from storage battery or dry cells. Attaches to windshield or body of car. Handsomely finished in black with nickel trimmings. Order through your dealer or direct. In ordering state make and model of car and battery voltage.

DEALERS WANTED
EVERYWHERE

C. H. FOSTER

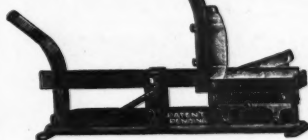
Manufacturer and Distributor
of Motor Car Accessories

2303 Michigan Blvd., Chicago



\$9
Complete

Any hood can be made ventilating type in 15 minutes with this machine.



Profits for Garagemen That Mean Big Money

Unventilated hoods reduce motor efficiency, force heat through the floor boards, and make summer driving uncomfortable. Owners are anxious to change.

Make Hoods Ventilating Type

The machine illustrated above, makes any hood ventilating type, in less than 15 minutes. Won't mar varnish or crack metal. Cuts clean, ornamental vent, shown below. Operated by one man. Completes job while customer waits. Charge \$1.50 to \$2 per car. Count the unventilated hoods that pass your garage. Every one means profitable business. One man made \$80 the first week—in spare time. Send for price and full details.

Write for free illustrated
circular

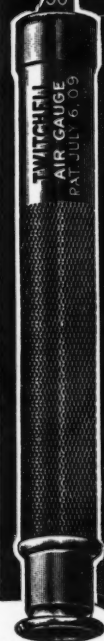
R. G. AMES & CO.

1339 Michigan Avenue
CHICAGO



Note clean cut, ornamental vent

Twitchell



The first question the tire adjuster will ask is: "Have you kept your tires inflated to the pressure we prescribe?"

If you haven't---and the condition of the tire will show whether you have or not---he will allow nothing for their premature destruction or blow-out.

Test your air pressure daily with a
TWITCHELL AIR GAUGE
and save your tires Price \$1.00

THE TWITCHELL GAUGE CO.

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CHICAGO, ILL.

Tire Insurance

for One Dollar

Guaranteed for 10,000 Miles



BRICTON Pneumatic Tires are guaranteed for 10,000 miles and under a specific 10,000 mile written service guarantee. What more can you ask of a tire? With Bricton Tires, punctures, blowouts and rim-cuts are eliminated—they are proof against ruts, oil and gasoline. Resilient and easy riding, too.

Try Them at Our Risk

Give Bricton Tires a free trial on your own car. Put them to test at our expense. Find out why Bricton Tires sales are increasing daily.

Your Tires Rebuilt the Bricton Way

If the fabric in the tires now on your car is in good condition, we can take them and make them proof against rim cutting, punctures, blowouts, sidewall breaks, skidding, ruts and oil and give you thousands of miles of additional service.

Write today for full information about Bricton Tires. Tire Rebuilding and details of our liberal Free Trial Offer.

THE BRICTON MFG. CO.

1285 Bricton Bldg.,

Brookings

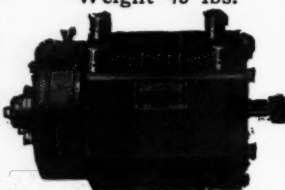
South Dakota

Bricton Pneumatic Tires

Dyneto
TRADE MARK
Weight 45 lbs.

REGISTERED The Single Unit Electric Starting and Lighting System. Lighter, yet more powerful than most two-unit systems.

Famous on the Franklin
Write for Catalog and Full Particulars



DYNETO ELECTRIC CO., Syracuse, N. Y.
Send Us Your Electrical Problems

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New England States
New York State
New Jersey

Pennsylvania
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Transcontinental, Showing All Trails

These maps were prepared for us by the Automobile Blue Book Company.
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There is More Power in
THAT GOOD GULF GASOLINE and SUPREME AUTO OIL

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Electric Auto-Lite Starting-Lighting-Ignition

Electric Auto-Lite equipment for automobiles is as famous for the service that backs it as for the reliability and economy of its operation.

ELECTRIC AUTO-LITE COMPANY
Home Office and Factory: Toledo, Ohio
New York Detroit Kansas City San Francisco

REPUBLIC TIRES
PLAIN, "WM"
AND STAGGARD TREADS

TRADE MARK REGISTERED
U. S. PATENT OFFICE

The Bearings Company of America
Sales Department, 250 W. 54th St., New York

THE STAR



COMPLETE THRUST BEARING



RADIAL RETAINERS

Manufacturers of Star Radial Ball Retainers, Star Ball Thrust Retainers, Star Complete Ball Thrust Bearings

MADE IN AMERICA

Highway Six
\$1690

National

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\$1990



National Motor Vehicle Co., Manufacturers, Indianapolis

EISEMANN

The most simple—the most accessible—the most durable—the most efficient magneto ever produced is the new Type G-4.

The Eisemann Magneto Company
Sales and General Offices,
32-33d St., Brooklyn, N. Y.
New York, N.Y. Indianapolis, Ind. Detroit, Mich.
245 W 56th St. 415-417 N. Capitol Ave. 802 Woodward Ave.



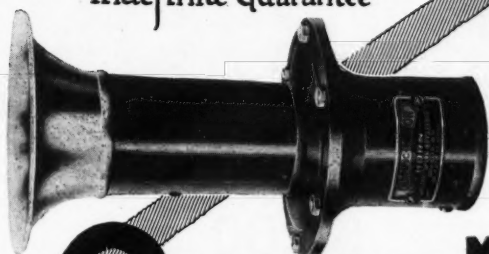
KINGSTON IGNITION DEVICES

High and low tension magnetos, make-and-break coils, dash coils, box coils, motorcycle coils, switches, spark plugs and other ignition specialties. Guaranteed satisfaction

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KOKOMO ELECTRIC COMPANY, Kokomo, Ind.

2 Types
Indefinite Guarantee



\$6

OLYMPIC MOTOR DRIVEN HORN

DON'T pay more than \$6 for an electric horn, when the motor driven OLYMPIC does the work of electric warning signals that sell for 3 times its price. Longer service, better guarantee. Easy to operate, and effective.

Under Hood Type, \$5

Outside Type, \$6

Olympic Vibrator Horn, \$2.50

75,000 OLYMPIC Vibrator horns are standard equipment on leading American cars. Give better service. Last longer. Indefinite guarantee.

Under Hood Type, \$2.50

Outside Type, \$3

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ELECTRIC SPARK APPLIANCE COMPANY
140 Imlay St., Brooklyn, N. Y.

THE F. E. CASTLE COMPANY

Western Distributors

872 Woodward Avenue

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Shanhouse Motorsuit

An Accessory everyone who drives an auto should have. What is more necessary than a garment to protect your clothes from dirt and grease, which you can slip on in a moment, and be covered from head to foot. It will last you for ordinary wear as long as your car. A very small investment and will save you many suits of clothes. Your money back if not satisfactory.

If your dealer doesn't carry it, send \$2.00 for one prepaid. Give chest measurement and leg length. Money back if not entirely satisfactory.

The Shanhouse Co., Rockford, Ill.

OAKES FAN-HORN and PUMP for FORD Cars — \$12.50

All three in one assembly. Replaces old fan in ten minutes.

Beartone

Fan-Horn \$5.00

Fan-Pump \$7.50

HORN in center of fan in logical place under hood, motor-driven.

Press button at driver's seat, instant response. A different warning sound that gets the road—any volume and range needed—no gears, batteries or wires. To pump tires, touch lever, that's all. Saves exertion and tire expense. Oakes' fan increases motor efficiency.

Write for full particulars or dealers' proposition

THE OAKES COMPANY
Indianapolis, Ind.

THE SIMMS HIGH-TENSION MAGNETO

AND

SIMMS-HUFF MOTOR GENERATOR

Buy a car equipped with the Simms High-Tension Magneto. Then you will have a car with the ignition system acknowledged by experts to be the most efficient.

Racing cars, cars that win hill climbs—are always equipped with high-tension magnetos.

See that any car you buy has the Simms-Huff Starting and Lighting System.

The Simms-Huff Motor Generator is the simplest, most powerful, and lightest weight starting and lighting generator.

Dealers, write for full information about the Simms-Huff Starting and Lighting System for Ford Cars.

Simms Magneto Company

East Orange, N. J.

Manufacturers of the most reliable ignition, starting and lighting systems for automobiles.

CLEAN UP and TRY

TRADE MARK
NON-FLUID OIL
REGISTERED IN
UNITED STATES PATENT OFFICE

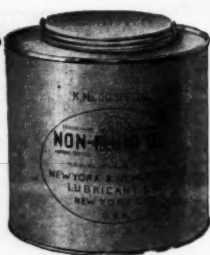
For Transmission and Differential
Lubrication

It will keep your car at its best longest at the least cost, because it is the one lubricant exactly adapted, and which never fails in its work. Year in and year out your bearings are fortified against wear because the destructive rubbing and heating from friction are arrested and absorbed by the lubricant itself. Get a can today and prove it.

Reduced prices for 1915. Ask your dealer.

Avoid substitutes—look for the orange-colored cans with above trademark

New York & New Jersey Lubricant Co.
165 Broadway, New York 1430 Michigan Ave., Chicago, Ill.



SPARTON

Hand Horns
NEW PRICE

\$4.00

**DELIVERIES NOW
ALL DEALERS**

THE SPARKS-WITHINGTON CO., JACKSON, MICH.

DOUBLE SEAL TIRE VALVE



No tool needed to
seat or remove Valve

Interchangeable with All Stems

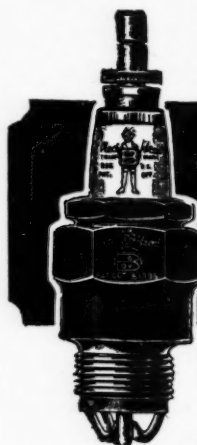
Fifty Cents Per Dozen
Single Valves, Five Cents



Actual
Size

Double Seal Tire Valve Company
1790 Broadway New York City

Link your motor to the **BIG BOY**—a big plug for big deeds. Guaranteed forever, because it's a—



Red Head
REG. U.S. PAT. OFF.
GUARANTEED FOREVER

BIG BOY.....\$1.00	Combination\$1.25
Regular75	Platinum Point..... 1.50
Priming 1.25	All Sizes—All Dealers

EMIL GROSSMAN MFG. CO., Inc.

Bush Terminal
Model Factory No. 20, Brooklyn (New York City)
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THE POWERFUL, SILENT SPHINX

\$695

A REAL AUTOMOBILE

The lightest, strongest, most serviceable and economical machine of its kind ever built.

112 inch wheel base. Electrically started and lighted.

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MARMON

The Easiest Riding Car in the World

New Series "Forty-One"

Write for Complete
Descriptive Literature

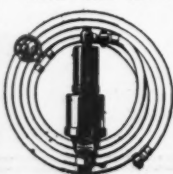
NORDYKE & MARMON COMPANY
Indianapolis (Est. 1851) Indiana

Hand Pumping Is Just Physical Torture!

But you will enjoy pumping tires with a

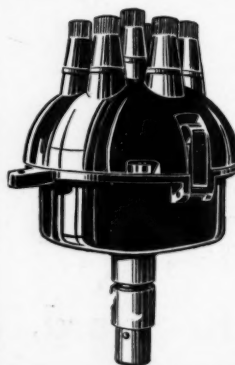
MAYO PUMP

Simply substitute the pump for any convenient spark plug. The motor does the work—lets the motorist out.



Price, complete with 12 ft. hose and gauge, \$10. MAYO Q. D. Spark Plug, \$1.50 extra. Try one Free on your car for 30 days.

MAYO MFG. CO.
55 E. 18th St., Chicago



The
**Atwater Kent
Ignition System**

Used by one-quarter of all
1915 U. S. A. built cars,
exclusive of Fords.

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PHILADELPHIA, PA.

DELCO

ELECTRIC LIGHTING CRANKING IGNITION

The man who sells a Delco equipped car has a talking point with a wonderful appeal to it.

THE DAYTON ENGINEERING
LABORATORIES COMPANY

Dayton, Ohio



May be carried on running board or under rear seat.



May be rolled into a package 7 x 20 inches. Wt. 12 to 18 lbs.

COMPAC Auto Tent—The Tourist's Hotel

Sleep out-of-doors. Save hotel bills. Get all the fun in touring out of it. Stop when you want to and where you want to.

The COMPAC Auto Tent is large and roomy with partition if desired. Waterproof, snakeproof, insect-proof. Easy to erect.

Price, \$18. Other grades \$24.00 to \$48.00. Write for details.



COMPAC TENT CO., Inc.
414 W. 10th St. Indianapolis, Ind.
Distributors—N. Y. Sporting Goods Co.,
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Ivor Johnson S. G. Co. Boston; J. A.
Marks & Co., Detroit; Ellery Arms Co.,
San Francisco; Gus. Habich, Indianapolis;
Browning Bros., Ogden, Utah.

VIKING

SPARK PLUGS

A greater sum of the essentials to unfailing service and complete satisfaction will be found in VIKING design and construction, than in any other plug at any price.

Buy VIKING PLUGS as an insurance of service

Price \$1.00 each—all styles

THE JOHN MAC GREGOR COMPANY INC.
ROSLINDALE BOSTON, MASS.

BROWN Jr. Tire Pump

NEW PRICE, With Gauge and "T," \$5.50

Built like a motor with lapped rings. A high grade pump at a small price for medium size tires. You cannot afford to run your car without this pump.

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The Brown Co. 120 Bellevue Ave. Syracuse, N. Y.

The Cornelian Light Car



\$410—Top and Windshield \$25 Extra

First car to qualify for the Indianapolis 500-mile race, breaking all world's records for cars of its class.

The Car with a Great Future

Blood Bros. Machine Company, Allegan, Mich.

Makers of the famous Blood Bros. Universal Joints

Before Your Lights Go Out and Your Starting Motor Fails!

Weston

Model 354 AMMETER

On Your Dashboard or Cowl

will keep you posted every minute regarding electrical conditions. It gives you warning of approaching trouble. Its exact information is invaluable—the cheapest and best insurance you can buy.

Write for full information.

Weston Electrical Instrument Co., 10 Weston Ave., Newark, N.J.
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HOLLEY

CARBURETOR

**NO MOVING PARTS
ONLY ONE ADJUSTMENT**

WRITE FOR PARTICULARS

Holley Brothers Co.
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Miller Tires

GEARED TO THE ROAD

Join the Miller Prosperity Procession

Be the exclusive Tire Dealer in your town—the Miller Dealer.

Write for the Miller Plan—it doesn't pit one dealer against another.

THE MILLER RUBBER CO., Akron, O.



BRAENDER

TIRES and TUBES
are famous for their **QUALITY**

We wish to announce that irrespective of action by any other organization **Braender Quality Will be Maintained**

Braender Net Prices to Car Owners

Tires.	Plain.	Non-Skid.	Gray Tube.	Red Tube.
30x3	9.00	10.35	2.35	2.60
30x3½	11.00	13.35	2.70	3.00
36x4½	27.35	31.45	5.20	5.80
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Main Office & Factory, **RUTHERFORD, N. J.**
New York, 250 West 54th Street
Agents in principal cities

Established
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\$19.75
SET OF
FOUR
And Extra Rim

As Good As They Look

**Parker-Hydraulic
PRESSED STEEL WHEELS**

improve the appearance of Ford cars but they don't stop there.

Let us tell you what they do for the motorist and why live dealers everywhere want to sell them.



The Hydraulic Pressed Steel Co.

3170 East 61st St., Cleveland, U. S. A.



Moline-Knight "40"

F. O. B. **\$1475** Factory

40 horsepower, 5 passenger touring and 2 passenger roadster, 118-inch wheel base, 34x4-inch tires (non-skid rear), spiral bevel gear rear axle, weighs 2,896 pounds ready for the road, Auto-Light starter, high tension ignition, complete equipment, 50 horsepower touring, roadster, sedan, limousine models—\$2,500 to \$3,800.

Moline Automobile Co., East Moline, Ill.



DOUBLE ACTION SHOCK ABSORBERS

HEAVY CAR TYPE

\$35.00 to \$45.00 per SET

FORD TYPE \$15.00 per SET

A. J. PICARD & CO.

1720-22 BROADWAY NEW YORK

SALISBURY

AXLES WHEELS PROPELLERS

Salisbury Wheel
& Mfg. Co.
JAMESTOWN, N.Y.

Women Say---
THE ELECTRIC GEAR SHIFT
makes a big gasoline car as easy to drive as an electric.

The C-H Magnetic Gear Shift

is being supplied as special equipment by

THE WINTON MOTOR CAR CO. THE L. P. C. MOTOR CO.
Cleveland, Ohio Racine, Wisconsin
THE THOS. B. JEFFERY CO. THE PULLMAN MOTOR CAR CO.
Kenosha, Wisconsin York, Pennsylvania

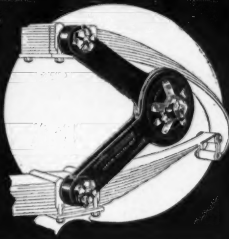
Write for booklet "Gear Shifting by Electricity"

The CUTLER HAMMER MFG. CO., Milwaukee, Wis.

★Hartford

SHOCK ABSORBER

For Comfort, Safety, Economy.

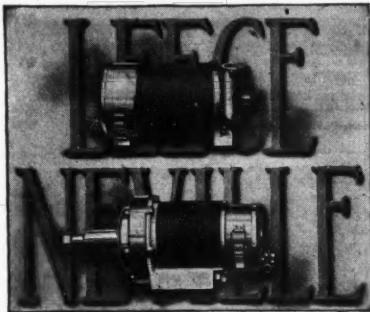


Stops jolting, jarring and vibration. Eliminates side-sway. Contributes to solid auto comfort. Prevents spring breakage. Makes tires last longer. Cuts cost of maintenance. Insures longer life for your car.

Complete literature on request. Write mentioning make, model and year of car and we will advise how to equip to secure genuine comfort. Your new car will be Hartford-equipped if you insist.

HARTFORD SUSPENSION CO., 146 Morgan St., Jersey City, N. J.
E. V. HARTFORD, President

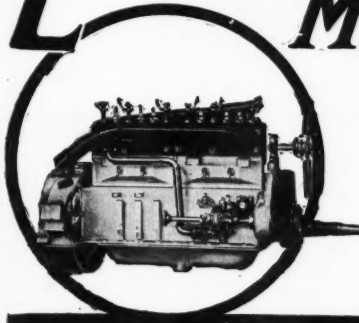
*Formerly Truitt-Hartford Shock Absorber.



THE
Leece-Neville
ELECTRIC
Starting-Lighting
SYSTEM
Efficient
Simple
Reliable

Ask any owner
of a Leece-Neville equipped car (58)
THE LEECE-NEVILLE CO., Cleveland, O.

Continental Motors



Models-FOURS
Model U, 2 3/4 x 4 Model C, 4 1/4 x 5 1/4
Model N, 3 1/2 x 5 Model E, 4 1/2 x 5 1/2
Model N, 3 3/4 x 5 Model T, 5 x 5 3/4
Model C, 3 3/4 x 5 1/4 Model T, 5 1/4 x 5 3/4
Models-SIXES
Model 7 W 3 3/4 x 4 1/2
Model 6 N 3 1/2 x 5
Model 6 P 3 3/4 x 5 1/4

CONTINENTAL
MOTOR MFG. CO.
DETROIT, MICH.

Factory Representative, K. F. Peterson,
122 S. Michigan Ave., Chicago

—even this old boy
is hitting on all cylinders

BUT—Hes Wasting Fuel

Don't think because your engine is hitting on all cylinders you're getting maximum service!

Write us for astonishing carburetor revelations—new facts you've probably never heard of—learn how the New Stromberg Carburetor will increase the power, speed, acceleration and gas economy of your car whether it is new or old. Be sure to state name, model and year of your car.



New **STROMBERG** Does it!
CARBURETOR

When Writing to Advertisers, Please Mention Motor Age

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We can create for you a Winton Six closed car precisely as you want it. That takes time, of course. If you delay ordering, you must content yourself with a stock model. So, make your selection **now**, and let us give your personal requirements the most exacting attention, and guarantee delivery to you before the first nip of the earliest frost. A card from you will bring full information.

THE WINTON COMPANY

424 Berea Road, Cleveland, Ohio, U. S. A.

World's First Maker of Sixes Exclusively

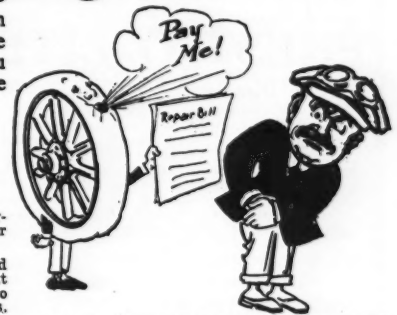
Own the vulcanizer you're paying for

Yes, paying for it in repair bills and tire service that you don't get. You buy two tires where one would do as well.

SHALER Vulcanizer

Mends tubes and casings perfectly. You or your chauffeur can use it. Prices \$2 and up.

One free copy of "Care and Repair of Tires" if you write at once. Tells what you need to know about tire-saving devices.



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It contains descriptions of all the famous Campbell Guaranteed Motor Car Accessories; Detachable Upholstery, Per c a m a Straps, Boots, Accessories for Fords, etc.

Territory open for reliable
established dealers

THE PERKINS-CAMPBELL COMPANY

624 Broadway, Cincinnati, O.
New York Office, 89 Chambers Street



ANNOUNCEMENT

The following prices f. o. b. Detroit, effective
August 2, 1915

Ford Runabout \$390.00

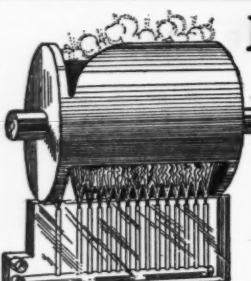
Ford Touring car..... 440.00

Ford Town Car..... 640.00

No speedometer included in this year's equipment,
otherwise cars fully equipped

Ford Motor Company

Detroit, Michigan



MASTER Carbureters

Makes gas like DYNAMITE.
Breaks fuel to finest possible state. WONDERFUL ECONOMY.

Study the principle
Write for Booklet

Fuel Inlet
Master Throttle and
Fuel Distributor

MASTER CARBURETER CORPORATION

1523-31 Fort St. W., Detroit, Mich.
Pacific Coast States: Master Carbureter Co., Inc., Los Angeles, Cal.

The New Waterproof —RAJAH— PLUG



Fills the Demand for an absolutely reliable (insulated) Waterproof Plug

Furnished in all the standard sizes with Rajah Regular Terminal fitting any cable. Rajah Ferrule Terminals, making a neater connection, will be furnished if a sample of cable is included with the order.

Price, \$1.50 Postpaid.
Rajah Giant Plug, \$1.50 Postpaid.
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RAJAH AUTO-SUPPLY CO., Bloomfield, N. J.
John Millen & Son, Ltd., Montreal, Toronto, Winnipeg, Vancouver.

Add to Garage Profits by Oxy - Acetylene Welding

Savings made please your patrons and pay good substantial profits.

PREST-O-LITE

Dissolved Acetylene
(Ready-made carbide gas)

adds to the efficiency and usefulness of any good welding equipment. We furnish thoroughly high grade welding apparatus for \$60.00. The average user will also need gas cylinders at an additional cost, and about \$10.00 worth of welding supplies. Truck and special equipment for cutting operations at extra cost.

Send for details of Prest-O-Lite Service for Oxy-Acetylene Welding.

The Prest-O-Lite Co., Inc.
The World's Largest Makers of
Dissolved Acetylene
233 Speedway Indianapolis, Ind.



Lexington


CRITERION OF ITS CLASS

Thoroughbred Six—\$1875
Minute Man Four—\$1375
Six Supreme—\$2575

Equipped with Moore Multiple Exhaust System

Write for details and co-operative dealer proposition

The Lexington-Howard Co.
18th Street West Connersville, Ind., U. S. A.



Steel Protectors


Each section 2" wide 1/8" thick. They hook to rim. As flexible as ever. Anti-skid, can't blow out or rim cut.

HOW CAN THE RUBBER WEAR OFF IF IT IS COVERED WITH STEEL?

Try 2 or 3 sections over any old blowout

Special prices to the first in new territory

Kimball Tire Case Co. 173 Council Bluffs, Ia.



Tire covered complete



Lowest Priced Electric Horn Obtainable

REXO II

\$3.85—Ready to Attach

Guaranteed for the Life of Your Car

THE GARFORD MFG. CO., 2503 Olive Street Elyria, Ohio, U. S. A.


THE RUTENBER MOTOR

Used in America's Best Light Weight Cars

—because at small initial and upkeep cost, it gives superior service at an economical figure.

THE RUTENBER MOTOR COMPANY
MARION, INDIANA
Chicago Office—10 S. La Salle St.

Model 22
3x5
6-cylinder



HOLLIER

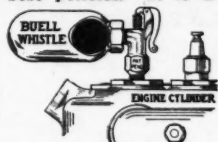
\$985 EIGHT \$985

It leads the leaders

THE LEWIS SPRING & AXLE CO.
JACKSON, MICHIGAN

Accident Insurance at 85c a Year

for 5 years. Cheap? Very! Good? Better than some of the best policies. It is a positive warning that will eliminate the accidents. Put a



Buell Explosion Whistle

on your car in addition to whatever signal you may now have and see how much better the Buell is as a warning device. If thirty days' use does not prove its worth, we will refund the purchase price.

Price postpaid.....\$4.25

Write for our circular. This is something worth investigating

DEALERS—Here is a simple little device that is making a hit. Our agents write that all they need to do is to get one on one of the prominent cars in a town and they sell themselves after that. See one and hear one and a sale is made.

Oregon Sales Co.—West Coast Distributors
434 Alder St. Portland, Oregon

BUELL MANUFACTURING CO., 1140 E. 46th St., Chicago

A SAMPLE TESTIMONIAL.
"Please send me your dealer's prices on your whistles. I have seen one of your whistles and think it is the finest made for anything near the price."

Gasoline Can't Explode

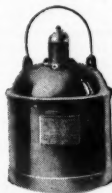
You can build a fire under a McNutt can—you can hold a match in the opening of a McNutt can—it will never explode.

Hundreds of tests have been made by the New York and other Fire Departments, but no McNutt can has ever exploded.

Also—these cans prevent loss by evaporation and are so well made and reinforced that they will outlast 20 ordinary containers.

SEND FOR CATALOGUE—Our catalogue describes cans for every use and gives prices. Tear out the advertisement now to remind you to send for it.

DEALERS—These cans and devices sell on sight; remarkable opportunity; write for proposition.



JOHN C. EAMES, Inc.

320 Broadway

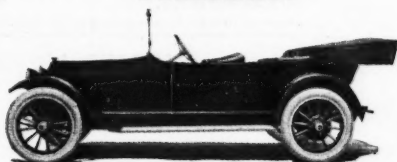
New York

Read!

Reflect!

Act!

Auburn
Four
\$985



Auburn
Six
\$1550

We are delivering NOW 1916 Auburn cars and indications are we will duplicate with them the wonderful success of our 1915 models. The new Auburn is a masterpiece of motor car builders' art. The specifications are unusually liberal—from electric starter and lights to cantilever springs—equipment complete. "The Most for the Money." Increased production permits the making of a few additions to our dealers' organization. Here's your opportunity to handle a line as profitable as it is permanent. Descriptive literature and dealers' proposition on request.

AUBURN AUTOMOBILE COMPANY
AUBURN, INDIANA, U. S. A.

For 1915
Ford Cars
With
Cowl
Dash



\$5
Special
Hinge
for
1914
Ford
Cars

Invest 10% of your Rebate
For 100% Comfort

Put \$5 of your \$50 rebate back into your car, and insure perfect riding comfort as long as your Ford lasts.

ILLINOIS
Automatic Windshield Hinge
Clear Vision—Ventilating

Make an up-to-date windshield out of your old one. Keep a cool draft blowing on your feet and legs these hot days, when you drive. The only windshield hinge made of tempered steel, and fully guaranteed. Ready to attach in old screw holes. Saves price of new style windshield. Gives same results. Write for free folder.

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Illinois Brass Manufacturing Co.
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Corcoran Lamps

GAS, OIL, AND ELECTRIC
CORCORAN LAMP CO.
CINCINNATI, OHIO



ZENITH CARBURETOR

KNOWN the world over as
the zenith of simplicity
and efficiency.

A precision instrument giving
permanently, exact carburetion
for your car.

Zenith Carburetor Co.
Detroit, Mich.

The Clearing House of the Motor Car Industry

*For Second Hand Cars, Surplus Parts, Accessories, Tires,
Machinery & all other Special Announcements of a Similar Character.*

ADVERTISING RATES Minimum space, 1/2 inch—One time, \$2.40. Three times, \$5.85. 1 inch—One time, \$4.50. Three times, \$10.80. 1 1/2 inches—One time, \$6.75. 2 inches—One time, \$8.75. Rates for other spaces and longer terms on request.

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ALCO—5 Passenger, 4 Cylinder
Electric lighted and generator; recently repainted; fully equipped. This is an elegant car for touring.
CONDON, 2635 Wabash Ave. Calumet 5311
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Four cylinder, air cooled, friction Transmission, 10 H. P. Henderson motor, magneto and special Schebler carburetor, sight feed oil system—no batteries required—38" tread, artillery wheels, V belt to rear wheels, 28x2 1/2 U S Studded Tires; single seat, another one can be added if desired. Will sell complete car or parts, write,

A. P. SITTON, C. E.
U. S. P. H. & M. H. S. Fort Stanton, N. Mex.

GET OUR LATEST BULLETIN OF USED CARS
You can get from us good, serviceable machines of various makes for \$400 and up.

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2367 Michigan Ave., Chicago, Ill.

Matheson

Cars and Repair Parts

FRANK F. MATHESON, Wilkes-Barre, Pa.

WHITE 30 GAS CAR FOR SALE CHEAP

40 H. P. White Steamer bargain. White steam plant—fine for boat

R. A. ROBBEL, 3025 Indiana Ave., Chicago

WANTED

1913 Model Mercer Speedster
Address Box E389, c/o Motor Age, Chicago

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FOR SALE—GARAGE. One of the best locations in eastern Indiana. Good chance for a first class mechanic with small capital. Agency for one of the best sellers.

Address Box E 388, care Motor Age

HELP WANTED

Large Jobbing House

With complete, attractive line of automobile accessories has openings for few more real salesmen who will carry samples of leaders and sell from newest, most complete catalogue of automobile supplies issued. Experienced men preferred, but others considered if capable, especially salesmen using car and making small towns. Also those selling hardware and electrical stores, garages and automobile houses. Splendid side line proposition that will eventually require and pay well for entire time. Reply in confidence, giving full details, experience, lines handled, territory covered, etc. Address

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\$600 FOR DESIGNER

Design for me a car to be assembled from parts now on the market to sell in competition with cars selling for \$750 to \$850, and earn \$600.

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10 LINCOLN MILLERS \$50.00 EACH

Send for Photo

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30 Fox St.

Bridgeport, Conn.

\$50—The Admiral Welding Equipment—\$50
Outfits you for handling any job. Decarbonizing Torch, Instruction Book and Supplies included. The Best at Any Price. Books Free

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MAGNETOS—SERVICE STATIONS

A Big Demand for Bosch, Eisemann and Mea magnetos. We pay cash for them. Send full description.

EISMAN MANUFACTURING CO.

Magneto Experts

217-22 Iowa St. Davenport, Iowa

MAGNETOS—Sold, Exchanged, Repaired
Dealers and repairers of generators, starting motors, magnetos and coils. Several Bosch, Remy and Splittdorf magnetos at bargain prices.

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Our Service Saves Your Electrical Equipment

It has taken years of study and experiment with every electrical appliance for the automobile to establish for you our thoroughly efficient service station.

Today, our battery department is equipped with every device known for prompt repairs, and is in charge of experienced workmen.

Our starting and magneto department gives you the benefit of the same high-grade service of other trained specialists.

Every job is thoroughly tested before delivery.

Official repair shop for

Willard Storage Batteries

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K. W. Magnetos

—but we repair anything electrical if it can be repaired.

The E. S. Cowie Electric Co.

Kansas City

Missouri

If you are in the market for anything in the ignition or lighting line, get our prices. All work guaranteed.

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EXPERT REPAIR WORK

On all makes of magnetos, coils, starters and generators—all work guaranteed. References, South Side State Bank of Chicago.

MOTOR CAR SERVICE CO.

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GUARANTEED WORKMANSHIP PROMPT SERVICE

Magnetos Repaired Armature Winding
Coil Winding

Factory Experts on All Electric Starters

MASTER SALES CO., Inc.

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MAGNETO REPAIRING
OFFICIAL EISEMANN SERVICE STATION
Complete repair department for all makes. We return work promptly and itemize all jobs estimated when required. Klaxon Service Station.
S. G. HOFFMAN MAGNETO CO.
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MAILING LISTS AND STATISTICS. Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of electric, trucks, Fords, Studebaker, Overland, etc. **MOTOR LIST CO. OF AMERICA,** 1107 Locust St., Des Moines, Iowa.

MANUFACTURERS' OPPORTUNITIES

WANTED—First-class lines, such as Bodies, Accessories, Castings, etc., to sell to automobile and other manufacturers throughout Indiana. We are well established Manufacturers' Agents, and can get the business. Address Box E-385, c/o Motor Age.

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A. L. DYKE'S AUTO INSTRUCTION. A new idea of instructing you with working models to care for and repair automobiles. Simplified instruction on self-starters and lighting just added. Send for free 32-page illustrated booklet. **A. L. Dyke, Box 16, Roe Bldg., St. Louis, Mo.**

Gas, Oil and Steam Engine Hand Book
370 pages, illustrated, cloth, \$1.00. Send for complete list.

Charles C. Thompson Co.
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"THE MODERN MOTOR CAR"

Just off the press—512 pages covering all phases of the Motor Car, 470 pages on Electric Starting and Lighting. Send for sample pages.

LAIRD & LEE, Inc.

1742 Michigan Avenue Chicago, Ill.

The Clearing House—continued.

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A Cushion Dressing That Does Not Soil Clothes

One coat of Peerless Cushion Dressing makes old cushions look like new. Will not soften up; will not crack, wash or rub off or injure your cushions. Ask anyone selling automobile supplies.

THE COLUMBUS VARNISH CO.
Makers Columbus, Ohio

ATTENTION

Our latest bargain sheet just off the press containing hundreds of items for your car at Special Prices.

WRITE FOR ONE
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A Durable Lamp Enamel

Peerless Lamp Enamel is a rich black finish that can be applied over brass, nickel or iron or old enamel. Two products air drying with a gloss or with a dull finish. Ask anyone selling automobile supplies.

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Makers Columbus, Ohio

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Just off the press. Write for it at once.

Fred Allen Auto Supply Co.
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ALL SEASON'S RECORDS MADE WITH Schebler equipment. Why not get a Schebler Model R for your car? Our exchange proposition makes it easy.

J. C. NICHOLS, Direct Factory Distributor
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All Types of Bearings
The New Departure Service Station
THE GWILLIAM COMPANY
Engineers

Specialists in Bearings

New York—253 West 58th St. (at Broadway)
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A STREAM-LINE HOOD

For 1915 Fords

Write for illustrated circular

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AUTOMOBILE PARTS

D 4 Bosch Magneto \$30.00. 3 speed transmission \$35.00. 40 H. P. Overland motor \$90.00. 35 H. P. Milwaukee motor \$75.00. B Presto \$10.00. 6 cylinder, 70 H. P. T head motor \$150.00. 20 H. P. Thomas motor with high tension magneto \$50.00. New 35 H. P. Buda motor \$100.00. 25 H. P. Stoddard-Dayton motor, complete \$90.00. 6 cyl. Winton parts.

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**AUTO TOPS AUTO CUSHIONS
TOP DUST HOODS**

For all makes of cars. Sit right down and write for our samples and price list.
Best Materials. High Class Workmanship
We maintain a separate department for repairs

WESTERN AUTO TOP CO.

1913-1933 Harney St. Omaha, Neb.

AUTOMOBILE TOPS

Mohair Tops, runabout, \$20.00; touring, \$30.00

Racing Seats, per pair, \$15.00

AMERICAN AUTO TOP MFG. CO.
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AUTOMOBILE TOPS

Built, Recovered and Repaired

C. G. MEYER & SON Tiffin, O.

A Few of Our Bargain Speedster Bodies For Fords

Beautiful Racy Design

SEND FOR LITERATURE

Complete and Ready for Installation

on any Ford

\$85.00

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"V" Shape Radiators—Honeycomb.....	\$23.50
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Special Ratio Gears, per set.....	15.00
Spark Plugs, per doz.....	1.80
Stream Line Hoods.....	7.50
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Electric Headlamps, pair.....	4.50

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Oakland 42—"V" Shape.....	\$25.00
Oakland 35—"V" Shape.....	25.00
Hup 20.....	25.00

Buick—All Models—Get Our Prices

Miscellaneous

Get Our Prices on Baker Rims

1¼" Stromberg Carburetors.....	\$ 8.00
1¼" Model "R" Schebler Carburetors....	8.00
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Model "B" Prest-O-Lite Tanks.....	10.00
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18" Steering Wheel.....	2.00
17" Steering Wheel.....	1.50
Bosch Du 4 Magnetos.....	30.00
Bosch Kick Switch Coils.....	10.00
4 Cyl. Splittorf Coll.....	6.00
Dash Air Pressure Pumps.....	1.00
4 lbs. Air Pressure Gauges.....	.75
¼" Pipe Thread Grease Cups.....	.10
4 Cyl. Remy R. D. Magnetos.....	10.00
4 Cyl. S. Remy Magnetos.....	10.00
Jacox Steering Gears, complete.....	10.00
Dyneto Lighting Generators.....	12.00
34x4 and 4½ Q. D. Wheels.....	2.00

Springs for Many Makes of Cars—Prices Right

Look for Additional Bargains Next Week

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AUTOMOBILE SPECIALTY COMPANY

999 Woodward Avenue

DETROIT, MICHIGAN

Get Our Prices

on anything for the automobile. We are the world's largest dealers and can supply you anything. Get our prices before buying.

Among thousands of value giving bargains are listed the following:

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Cadillac, several models, New Touring Bodies.....	\$ 75.00
Buick, several models, New Touring Bodies.....	\$65.00 & 75.00
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Empire New Touring Bodies.....	65.00
and many others.	

ENGINES

Herschell Spillman 6 cyl. 50 H.P.....	\$275.00
Herschell Spillman 4 cyl. 40 H.P.....	175.00
Brownell Unit Power Plant 6 cyl. 50 H.P.	275.00
Brownell Unit Power Plant 6 cyl. 35 H.P.	225.00
Wisconsin Unit Power Plant 6 cyl. 60 H.P.	225.00
Buda Motor 4 cyl. 35 H.P.....	175.00
Continental Motor 4 cyl. 15 H.P.....	65.00
And many others.	

AXLES

Weston Mott Rear Axle, New medium weight.....	\$ 45.00
Weston Mott Rear Axle, New heavy weight.....	55.00
Lewis Rear Axle, New heavy weight....	60.00

We also have a selection of used overhauled axles at \$20.00 up.

NEW RADIATORS GUARANTEED

Ford Honeycomb Flat.....	\$ 19.50
Ford Honeycomb "V" shaped.....	27.50
Buick "10" Honeycomb Flat.....	22.50
Buick "10" Honeycomb "V" shaped.....	27.50
Rambler, all models.....	23.50
Hudson "20" Honeycomb.....	29.00

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Ford Touring Tops complete.....	\$ 18.50
Ford Roadster Tops complete.....	15.00
Ford 1-Man Top with Jiffy curtains....	25.00
Ford Cowl Shield.....	12.00
Ford Dem. Wheel sets.....	15.95
Speedometer, Stewart & Warner, \$40 style	9.50
Elec. Torpedo B & N Head lamps, 12" size.....	\$5.00 pr.
Tool Boxes, all sizes.....	1.45 ea.
Auto creepers, large size.....	.95 ea.
Gasoline Tanks, all sizes.....	4.50 up
Bumpers, all styles.....	2.50 up

THOUSANDS OF OTHERS

SEND FOR OUR "PRICE WRECKER"

Times Square Auto Co.

WORLD'S LARGEST DEALERS

S. W. Cor. 56th St. & Broadway, N. Y.

1210 Michigan Ave., Chicago

Made for Ford Tops

A coat of Peerless Ford Top Dressing brightens, renews and prolongs the life of your Ford top. An especially prepared dressing for this material. Ask anyone selling automobile supplies.

THE COLUMBUS VARNISH CO.
Makers Columbus, Ohio

RACING BODIES AND SEATS

for all chassis—guaranteed to fit.

Fenders, Hoods, Tanks, Radiators

STANDARD AUTO SHEET METAL WORKS
532 So. Canal Street Chicago, Ill.

The Clearing House—continued.

Auto Tops Bodies and Seat Covers
Hand made. We make a specialty of one man tops with Jiffy curtains. Write for prices.
ST. LOUIS AUTO TOP CO.
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One Firm One Service
One Guarantee

Back of Every Bearing Ground by

Ahlberg Bearing Company

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Cleveland

Boston

Detroit

St. Louis

Los Angeles

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Factory Sale—New, Absolutely Guaranteed
6-150, \$18; 6-120, \$15; 6-80, \$9; 6-60, \$6.25
THE AMPVO BATTERY CO.
3031 Michigan Ave. Chicago, Ill.

Big Stock Reducing Sale

Model T Ford engine, \$50.00; steering gears, \$5.00; shaft drive rear axles, \$20.00; double chain drive axles, \$10.00; single chain drive, \$5.00; front axles, \$5.00; wheels, \$6.00 per set; electric horns, \$3.00; bulb horns, \$1.75; Ford wind shields, \$8.50; Ford electric starters complete with brackets to install, \$28.00; Ford roadster dust hoods, \$1.50; Remy magneto, four cyl., \$18; two cyl., \$14.00; Remy magneto coils, \$7.50; Splittorf, \$8.00; two cyl. oiler, \$8.00; Ford coils, \$12.00. All kinds of repairs for Model 10 Buick and two cyl. Rambler cheap.

TERMS CASH

AUTO SERVICE CO.

Sutherland

Iowa

Bucket Seats

Racing Bodies Delivery Bodies for Fords
AUTO REMODELING CO.
1503 Michigan Avenue Chicago, Ill.

Cocoa and Carpet Mats, Hand Made Seat Covers, Auto Tops Built and Repaired

AUTO CAPE TOP CO.
2334 Michigan Ave. Chicago, Ill.

DEALERS:

Ford gasoline gauge. Accurate, registers in gallons. Always in view. Price \$1.00. Sample sent any place in U. S. if you send 60 cents.
HENES SALES CORPORATION
443 Barry Ave. Chicago, Ill.

Demountable Wire Wheels

For Fords; Car-Nation, and Hupp 20, only \$12 for 5. Gas and electric head lamps for Fords and similar sizes, only \$3.25 pair. Stylish side lamps, \$1.00.

1/3 Deposit with C. O. D. Orders.

BENEDICT

63 Winder St.

Detroit, Mich.

DOLLARS SAVED

BY USING

"KUTFILLER"

A Genuine Para Rubber Compound. For filling tire cuts. Solidifies over night. Positively self-vulcanizing. One trial will convince the most skeptical.

1/4 lb. can \$1.25

Send for a can today. Don't wait!

Satisfaction guaranteed or money refunded

S. V. RUBBER WORKS

MORRISTOWN

NEW JERSEY

LOOK BEFORE YOU LEAP

Always before you spend your good money on automobile accessories and supplies. We have in our huge warehouses the world's largest stock and sell at prices below manufacturer.

HERE'S THE EVIDENCE

6-volt lighting generators, each.....	\$17.50
Jacox steering gears, right hand drive, each	7.50
Control assembly (while they last) each	3.50
Mufflers (all sizes), each.....	1.00
Splash guards, pair.....	1.00
Dashes, each.....	.75
32x3 1/2" Detroit demountable rims (for Dunlop straight side tires), each....	1.50
Front axles with hubs.....	12.00 up
Four 36x4 Firestone Universal wheels and five rims (while they last) at....	21.00
Drag links, each.....	1.50
Locking rings, all sizes and makes (1 week only)50
1 1/4" Bennett Carburetors, each.....	4.00
Dash ventilators, per pair.....	.50
Silent chains for all cars, per foot....	.60
Brass running board moulding, foot....	.03
Foot rails, nickel plated.....	.35
Diamond repair outfit No. 6.....	.50
Windshields, 37x23, clear vision.....	6.00
Springs, all sizes, from.....	2.00 up
Studebaker "25" radiators.....	15.00
Radiators with hood and support, Packard style	30.00
Oil side lamps, black and brass, per pair	2.00 up
\$24.00 4 Cyl. Kellogg tire pumps, only a few left, each.....	12.50
\$25.00 Noll power tire pumps (short time only), each	12.50
Fenders to fit all cars—Write us for Prices.	

TOPS

Maxwell tops with "Jiffy" curtains from	\$8.00 to 15.00
(Dust boot \$2.00 extra)	
7-pass, touring car, tops, from \$10.00 to	15.00
Cadillac tops (all models) with side curtains, from	17.50 up
All tops for all cars at bargain prices. —Write for chart.	
\$10.00 spark plug power pumps, each	6.50

RADIATORS—For Fords

Model T Honeycomb.....	17.00
Model T Honeycomb (V shape brass) ..	23.00
Model T Honeycomb (V shape nickel) ..	25.00
Radiators for all other makes at bargain prices. Write us.	

All Parts to Build Complete Cars

10,000 BIG BARGAINS NOT LISTED. ALL MADE IN U. S. A.—WRITE FOR CATALOG.

PURITAN MACHINE CO.

"The House That Dunk Built"

410 Lafayette Boulevard,
DETROIT, U. S. A.

ALL PARTS FOR ALL CARS

EMPIRE 25
FOR SALE—Two pair cylinders for Empire Model 25. 3 1/2 in. bore by 4 1/2 in. stroke. Complete with pistons, piston pins, rings and valves. Guaranteed good as new. Will sell very cheap.
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Equipped with F. & H. Special Wire Wheel Rims. Adaptable to any car. Complete equipment for Ford cars.

THE F. & H. WIRE WHEEL CO.
Springfield, O.

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Commercial bodies guaranteed to fit Model "T" Ford. Bucket seats not painted or trimmed, \$5.00 per pair. Trimmed and upholstered backs and cushions, \$15.00 per pair. We also build a full line of Speedster bodies complete; also Ambulance and Undertakers' cars all for Ford chassis. Send for our catalog. Agents wanted everywhere.

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We manufacture tapered axles for Fords of a particularly tough steel and are the only manufacturers who guarantee that the axles for Fords which we furnish will not crack out in the keyseats for a period of one year, each axle being stamped with the date at time of shipment.

Price, \$2.50.

Dealers, regular discounts.

We also manufacture Spring Radius Rods, Radiator Cradles, Kant Kum Off Belt Holders, and the celebrated "Angiers Spare Demountable Wheel" for the Ford car.

"ANGIERS"

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Agents wanted for our lines

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New 1915 cowl dash Ford Touring and Roadster Bodies at prices that appeal. Get our prices before buying. **LONDON AUTO SUPPLY CO.**, 2548 Wabash Ave., Chicago.

FOR FORDS

The M-G Front Axle Brace and Shock Absorber

is a necessity, not a luxury. Made of high grade spring steel. Positively prevents bending or breaking of radius rod. Makes car steer and ride better. Sold under a money-back guarantee.
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FOR LEAKY AUTO TOPS

"Hippo" Waterproof Filler will make any leaky mohair or canvas top waterproof. Not a paint, but a chemical filler which effectively fills all pin and needle holes. Doubles life of top. 3 quarts covers touring car top and curtains. Price \$2.00. Fully guaranteed. You take no chances. Order now.

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Keep Your Engine Clean

One coat of Peerless Cylinder Enamel, made in either the black or gray color will cover all dirt and save your metal parts from rust. Not affected by heat, gasoline or grease. Ask anyone selling automobile supplies.

THE COLUMBUS VARNISH CO.

Makers

Columbus, Ohio

NEW 1915 FORD ROADSTER BODIES

These bodies include new cowl, top, cushions, side curtains, slip cover, floor boards, rubber mat, dash and hood support, windshield, rear round fenders and irons, 2 side lamps and tail lamp. Complete, \$65.00 f. o. b. Detroit, crated. Fit any Ford chassis from 1912 up.

JOHN C. NAGEL

425-33 Baker St.

Detroit, Mich.

SHIP THAT TROUBLESOME CARBURETOR by Parcel Post. We rebuild and install new parts. Factory testing methods used. Service Station for Rayfield, Schebler, Stromberg and Holly. All work guaranteed. **Wills, Carburetor Specialists.** 358-360 Belleville Ave., Newark, N. J.

The Clearing House—continued.

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Closing Out Bodies, Motors, Etc.
 Cadillac 1914 touring bodies.....\$75.00
 Krit 1914 bodies, roadster..... 35.00
 Touring..... 45.00
 Studebaker six-cyl. 1915 bodies, 5-pass.. 65.00
 1912 E. M. F. 30 touring, 1913 Studebaker 25 touring and 1913 Studebaker 25 roadster, each..... 50.00
 Round gasoline tanks, upwards from..... 2.00
 Cadillac fenders, each..... 3.00
 Maxwell Crown fenders, each..... 2.00
 Splitdorf magnetos..... 9.00
 Splitdorf Model D coils..... 6.00
 Splitdorf Model X coils..... 8.00
 Studebaker 25 and 35 radiators..... 15.00
 Studebaker 25 motor, electric starter and generator..... 125.00
 Studebaker six-cyl. motor..... 125.00
 E. M. F. parts for sale

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Paint Your Car Yourself

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

Arsenal Varnish Company
 Auto Dept. Rock Island, Ill.

RACING SEATS SPEEDSTER BODIES

All equipment for changing your car to a Speedster
 Bodies, Tanks, Hoods, Cows, etc.

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 1627 Michigan Ave. Chicago, Ill.

RADIATORS

At Lowest Prices

We guarantee to sell radiators for any car at prices as low in all cases, and lower in many than any other firm in the United States. Send for our list and prices. That's the proof.

AUTO PARTS CO.

737-39 W. Jackson Blvd. Chicago, Ill.

RADIATOR BARGAINS

Ford model T honeycomb, V-shaped.....\$22.50
 Buick 16 and 17..... 33.50
 Buick 10..... 30.00
 Hudson 20, 32 and 33..... 28.50
 Chalmers 30..... 30.00
 Cutting, Models A and B, 40 and T 35..... 30.00
 Colby, Models 40 and 50..... 30.00
 Rambler radiators all models..... 26.00

Write for prices on other makes

AUTOMOBILE APPLIANCE CO.

1436-38 So. Michigan Ave., Chicago, Ill.

Radiator Bargains on STUDEBAKER 25 & 35 MODELS

We are offering for cash, while they last, these popular radiators.
 They are all new, black enamel finish, Fin and Tube construction.

Price \$16.00 each f. o. b. Detroit

Detroit Radiator & Specialty Co.
 963 Woodward Ave., Detroit, Mich.

RIMS—ALL MAKES AND TYPES

Parts for all old types, including Goodyear '7. Largest distributors. Dealers—Write for Prices.

CITY AUTO TIRE & SUPPLY CO.

2352 Euclid Avenue Cleveland, Ohio

SNAPS FROM RECENT BIG DEALS FOR QUICK BUYERS

10,000 storage tanks, 50-10,000 gallons capacity. 7,500 tool kits for Fords and larger cars. Lathes, Drill Presses and all other small and large machine tools. Equipment of every kind for garage owners and repair men. Write for complete list of snaps. No. MB 146.

HARRIS BROTHERS COMPANY
 Owners Chicago House Wrecking Company
 35th & Iron Streets Chicago

Storage Batteries bought or rebuilt. All conditions. New and second hand batteries for sale or exchange. Magnetos rebuilt, remagnetized \$1.00 to \$2.00, Ford \$1.50.
B. W. SMITH, Box 592, Montpelier, Ind.

SNAPS

Rayfield 1 1/4" and 1 1/2" carburetors.....\$ 15.00
 Stromberg carburetors G No. 2 Dbl. Jet 1 1/4"..... 11.00
 Stromberg carburetor A No. 2 Water Jacket 1 1/4"..... 12.50
 Schebler Model R 1 1/4"..... 11.50
 Schebler Model L 1 1/4"..... 8.00
 Marvel, Kingston or Holly Carburetors 1 1/4" choice..... 3.00
 Prest-O-Lite tanks, Model B, filled..... 11.50
 Gas generators..... .90
 Stewart speedometer, Model B, \$50.00 list..... 12.50
 Stewart speedometer clock and electric light combined, \$85.00 list..... 20.50
 Elsemann 6 cyl. H. T. Model E. M. I. R. 6, new..... 42.50
 Magnetos, 6 cyl. K. W. high tension..... 20.00
 Combination tool box and running boards, 60" long..... 2.50
 Plain metal running boards with wood underneath..... 1.75
 4 cyl. Rambler motor, Model 83, new.... 175.00

Other parts and accessories at equally low figures

AUTOMOBILE APPLIANCE CO.

1436-38 Michigan Ave. Chicago, Ill.

Some Bargains

Splitdorf Model A Magnetos, new.....\$10.00
 Ford Crown Fenders, per set..... 12.50
 Oakland German Silver Radiator, Model 35, new..... 35.00
 Justrite Tire Tools, best on market.....75c ea.
 Tapco Tires 32x3 1/2 Q. D. Clincher, only \$9.00 ea.
 Peerless Hand Horns..... 3.25 ea.
 Noremco Hand Horns..... 3.25 ea.
 Gemmer Steering Gears, L. H. Drive, new..... 15.00 ea.
 Carnation Front Axles..... 6.00 ea.
 Carnation Rear Axles..... 20.00 ea.
 Write for Catalog. Hundreds of other Bargains

U.S. Auto Supply Co.

859 Woodward Ave., Detroit, Mich.

TRUSTEE'S SALE

IN THE DISTRICT COURT OF THE UNITED STATES, FOR THE SOUTHERN DISTRICT OF ILLINOIS, SOUTHERN DIVISION.

In the Matter of
 The Typhoon Signal Company } In Bankruptcy,
 A Corporation, Bankrupt. } No. 2538.

By virtue of an order of the Referee in Bankruptcy of the Southern District of Illinois, the undersigned Trustee, will receive sealed bids (bids to be auctioned) for the purchase, for cash, of the stock, machinery and fixtures, of the above entitled corporation, at its office, Lincoln, Illinois, up to 2 o'clock P. M. Saturday, August 28, 1915. The property consists of office furniture and equipment, a miscellaneous lot of stock used for the manufacture of electric and automobile horns, lathes, shapers, millers, punch presses, screw presses, drill presses, trimmers, buffers, grinders, nickel plating outfit, baking ovens, etc. A copy of the inventory will be sent on application. All bids to be accompanied by a certified check for ten per cent of the bid. Sale subject to approval by the court.

THOMAS H. STOKES, Trustee.
 Lincoln, Illinois, August 7, 1915.

U. S. L. Starters at \$100.00

We have a few of these starters complete that we can sell at the above price.

PHILADELPHIA MACHINE WORKS

67 Laurel St. Philadelphia, Pa.

We Buy New Bearings

of all kinds
 What Have You to Sell?

M. G. TIGAR BEARINGS CO., 1876 Broadway, New York

You Want a Fender Enamel for Your Fenders

You want the heavy bodied, rich, gloss Peerless Jet Black Fender Japan to give the tone and imitation of a baked enamel finish for your fenders. Ask anyone selling automobile supplies.

THE COLUMBUS VARNISH CO.
 Makers Columbus, Ohio

WHEELS For any car or Truck. New Ford Wheels with 30x3 1/2 Clincher rims.....\$1.95
 2211 S. Michigan Ave. Chicago
MILLAR WHEEL WORKS

PARTS AND ACCESSORIES WANTED

WANTED

Will buy old storage batteries or take them on new ones. New and rebuilt batteries for sale
B. W. SMITH
 Box 592 Montpelier, Ind.

PATENTS & PATENT ATTORNEYS

C. L. Parker, Patent Attorney

Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C.
 Pamphlet of instruction sent upon request.

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MILO B. STEVENS & CO.
 53 W. Jackson Blvd., Chicago
 Established 1864 Main Office Washington,

PORTABLE GARAGES

WACO PORTABLE GARAGES

Made in two styles—wood and imitation brick made of steel sheeting. \$55 and up. Write for FREE CATALOGUE 11.

WABASH AUTOMOBILE CO. Chicago
 1311-13 Wabash Ave.

\$62.50 GARAGE \$62.50

10x12 FORD SPECIAL 10x12

2-foot width \$10.00 extra, 2-foot length

GARAGE CONSTRUCTION COMPANY
 Grant & Oliver Ave. Pittsburgh, Pa.

RADIATOR AND LAMP REPAIRING

ALL OUR RADIATOR REPAIRING GUARANTEED. New Radiators, Hoods, Fenders, Tanks and New Cores installed in old radiators at bargain prices.

ILLINOIS AUTO SHEET METAL WORKS
 1712-14 Michigan Ave. Chicago, Ill.

A New Radiator or Your Old One

repaired. Repairs in one day—a new radiator in two days. We are specialists also on fenders, hoods, gas tanks, lamps and all auto sheet metal work.

WABASH AUTO RADIATOR MFG. CO.
 (Harrison 4126) 1137 Wabash Ave., Chicago, Ill.

AUTO RADIATORS REPAIRED

And rebuilt to look like new. All work guaranteed. Quick Service. Low Prices.

AUTO RADIATOR CO.

114 N. Crawford Ave. Chicago

CHICAGO MFG. CO.

1458-60-62-64 Michigan Ave., Chicago
 We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

M. & L. Auto Sheet Metal Works
 Rebuild and repair radiators, hoods, fenders, tanks, lamps, etc. Tel. Douglas 4024.

3518 Vincennes Ave., Chicago, Ill.

The Clearing House—continued.

EUREKA DIAMOND HONEY-COMB RADIATORS FOR ANY MAKE OF CAR

For Ford cars. Absolute satisfaction guaranteed—the best that money and brains can produce. V type in polished brass and nickel. Flat face in polished brass and nickel. Lowest prices on the market. Discount to jobbers and the trade.
EUREKA AUTO PARTS CO.
1918 Pine St. St. Louis, Mo.

ONLY RADIATOR FACTORY IN NORTHWEST

Pioneer manufacturer. Why send your radiator down east when you can ship it to us, save time, expense, freight, money and get best workmanship? Prices right. Make new radiators, allow for old one.

TODD MANUFACTURING CO.
820-824 Mary Pl. Minneapolis, Minn.

RADIATORS REPAIRED

Any make or style. We are specialists and guarantee satisfaction. Out-of-town orders receive prompt attention. **F. C. ROHDE, 4135 Olive St., St. Louis, Mo.**

SHEPPARD MANUFACTURING CO.
1331 Jackson Boulevard, Chicago
AUTO RADIATORS MANUFACTURED
for any make of car

RADIATORS REPAIRED

Leaking and wrecked radiators made equal to new. New cores or any part fitted in any radiator. Hoods, Fenders, Tanks made to order. **GUARANTEED WORK—QUICK SERVICE**
Write for prices. Phone Haymarket 4037.

W(RIGHT) RADIATORS

Have stood the test of years—most durable and efficient. Get the best at less cost than others. Don't order until you send for our prices, and illustration of construction. Honeycomb and Bridge Fin Types (tubular). All standard makes in stock. Exceptionally low price on Fords. Dealer's discount.

Wright Cooler & Hood Co.
1253 S. Michigan Ave. Chicago, Ill.

REBUILDING AND REPAIRING

A. A. A. SCORED CYLINDERS
Repaired by electricity. Filled with silver composition. Same piston and rings used. No warping of cylinders. Also welding.
L. LAWRENCE & CO.
Newark, N. J.

ANDRE G. CATELAIN

Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelain Hose Coupling.
1446-8 Indiana Avenue Chicago, Ill.

"BUTLER'S SPECIAL ALLOY PISTONS"

Only one-third the weight of cast iron. Eliminate vibration, noise, wear and tear on bearings, and car. Higher efficiency, easier cranked, quicker pickup, more speed, less carbon. Set of FORD pistons delivered \$25 guaranteed. The greatest improvement possible for the FORD. CYLINDERS ground and fitted with Standard or Special Alloy Pistons. Oxy-Acetylene Welding.

BUTLER MFG. CO.
Est. 1897 Knightstown, Ind.

Crankshafts, Crankcases, Connecting Rods, pistons, scored cylinders made equal to new with our New Silver Iron process—use the same piston and rings.

POWELL-ELLIOTT AUTO REPAIR CO.
143 Rogers Ave., cor. Sterling Pl., Brooklyn, N. Y.

CYLINDER GRINDING

Cylinders ground and fitted with new pistons and rings. Most completely equipped shop in the west. Patterns free. Guaranteed work. Quick service.

A. H. SULLIVAN & CO.

4143 to 4149 LaCade Ave., St. Louis, Mo.

CYLINDER GRINDING

Either cast iron pistons and rings or our special light alloy pistons and rings furnished. State make of car in writing.
STAFFORD MOTOR CO.
2201-2209 Campbell Ave. Kansas City, Mo.

CYLINDER GRINDING

on automatic machinery by skilled mechanics at prices that will interest you. Gears, axles, valves and parts of all kinds made of high grade alloy steel. Send us your worn or broken parts and we will replace them.

Oxy-Acetylene Welding
of cracked cylinders a specialty
ADAPT MACHINERY CO.
1624 So. Wabash Ave. Chicago, Ill.

CYLINDER GRINDING

Special Light Alloy
Pistons

Our special facilities enable us to do highest grade work. Over 225 piston patterns.

AUTO ENGINE WORKS
ST. PAUL, MINN.

Cylinders Rebored & Reground

and fitted with lighter pistons and McCadden Leakless Rings, regrind pins and rebush rods, makes a smoother running motor than a new one. We set the pace on better rings and lighter pistons.

MCCADDEN MACHINE WORKS
St. Cloud, Minn.

CYLINDERS REBORED AND REGROUND

Fitted with my heat treated light weight pistons and patented three section rings.

From \$6 to \$15 per Cylinder
Ford cylinders reground, fitted with new piston rings, wrist pins and bushings for \$20.00.

TRUMP MANUFACTURING CO.
Crown Point Ind.

CYLINDERS REBORED

Including new pistons and rings, \$7 to \$11 per cylinder. General overhauling and repairing.

Welding
Cylinders, Crank Cases and Crank Shafts Welded
STERLING ENGINE COMPANY
331 So. Clinton St. Chicago, Ill.

CYLINDERS REBORED
With new Pistons and Rings fitted, \$8 each. Crankshafts turned. Gears made. Fine machine work.

SALTER MOTOR MFG. CO.
1518 Oakland Ave. Kansas City, Mo.

CYLINDERS REGROUND

and fitted with Special Composition heat-treated rings and heat-treated pistons. \$7.00 to \$15.00 per cylinder. Ford cylinders reground and fitted with Standard weight pistons, \$18.00. Special light pistons. \$24.00. Oxy-Acetylene Welding.

BERNHARD & TURNER AUTO CO.
Des Moines, Iowa

CYLINDERS REGROUND

Including new pistons and rings for \$5 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices. Ford cylinders reground, including new pistons, rings and wrist-pins, for \$20.00.

THE CROWN MACHINE SHOP
Crown Point, Ind.

LEE W. OLDFIELD
Minneapolis, Minnesota
Extra light reciprocating parts and accurate cylinder grinding my specialty.

REPAIR EXPERTS—The satisfaction of having your repairs done by expert mechanics in Connecticut's best equipped garage is important to you. We specialize in automobile painting and repairing. Full line supplies. Send your repairs to **SMITH'S GARAGE, West Park, Stamford, Connecticut.**

The Acme Cylinder Grinder

Designed especially for you. Efficient—simple of operation—durable in construction. Is made to go on any lathe. Cylinders do not rotate. The Cylinder Grinding Business is increasing every day. A small amount will install an Acme Grinder in your shop. Write today for descriptive circular and price.

ACME GRINDER CO.
Minneapolis, Minn.

WE THOROUGHLY OVERHAUL

TRUCKS AND PLEASURE CARS
REBORING OF CYLINDERS, furnishing new pistons and rings at lowest possible prices. **SCORED CYLINDERS** repaired by our electric process and thoroughly guaranteed. **WELDING OF CYLINDERS**, crank-cases and all parts of cars. We are automobile specialists. Write for booklet.

HUB MACHINE CO.
22nd and Race Sts. Philadelphia, Pa.

WE REGRIND CYLINDERS
Furnish our heat treated piston rings and pistons. First class equipment, 15 years' experience. Write for our prices.

BRIDGEPORT PISTON RING CO.
Bridgeport, Conn.

REPAIR PARTS

Abbott K-R-I-T Michigan Speedwell Headquarters Car Owners

Let us furnish you service on original repair parts. World's Largest Stock. World's Lowest Prices.

PURITAN MACHINE CO.

A. O. DUNK, President
410 Lafayette Blvd., Detroit, U. S. A.

ALL REPAIR PARTS
Supplied promptly, any "orphan" car. Send us broken parts for quick duplication; service the best and prices right.

AUTO PARTS CO.
1404 Henn. Ave. Minneapolis, Minn.

American Underslung and Marion

Motor Car Parts and Service
CHARLES E. RIESS & CO., Inc.
1690 Broadway, New York

AMERICAN UNDERSLUNG

We are the sole owners, manufacturers and distributors of repair parts for ALL MODELS AMERICAN UNDERSLUNG CARS.

AMERICAN MOTORS PARTS CO.
831-33-35-37 E. Washington St.
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AMERICAN UNDERSLUNG PARTS AND REPAIRS

Exclusive Sales Representatives for Manufacturers who supplied Motors, Axles, Wheels, Transmissions, Steering Columns, Control Levers, etc., etc., to the

American Motors Company
Write for prices on parts needed in connection with American cars.
V. A. LONGAKER COMPANY
INDIANAPOLIS, IND.

The Clearing House—continued.

Automobile Repairmen and Owners

It is valuable to know where to get parts and repairs for any car. Keep this list so that you will be posted.

MOTORS—4 CYL.

50 Buda 4-cyl. 40 H.P. 4 1/4 x 5 1/4	\$135.00
39 Marion 35 H.P. fan, crank and pump	115.00
4 Piggins "T" head, 4x4 1/2, with pump	135.00
1 Krit 1915 unit power plant, complete, including Remy uni-sparker, carburetor and pump	175.00
1 Krit 1914 unit power plant	160.00
1 Krit 1913 unit power plant (used)	135.00
1 Croxton Buda 4-cyl. 4 1/4 x 5 1/4	125.00
1 Oswald 4-cyl. 4x4 1/2	85.00
1 Jackson 4-cyl. unit power plant	125.00
1 Ruttenbur 4-cyl., used	75.00
1 Everitt 6-cyl., 48 H.P., 4x4 1/2	198.00
1 Chase 3-cyl. 2-cycle A. C. motor	50.00

TRANSMISSIONS

8 Brown & Lipe three speed	50.00
2 Krit 1912, with multiple disc clutch and pedals	45.00
1 Krit 1915 center control, with multiple disc clutch, pedals and levers	70.00
10 Keeton four-speed, center control with levers	75.00
158 Shaft drive, planetary transmissions 8-in.	20.00

REAR AXLES

13 Weston Mott full floating, complete	85.00
50 Weston Mott three quarter floating, complete	45.00
1 Sheldon 4-1 ratio, complete	50.00
250 Car-Nation (semi-floating), complete	25.00

FRONT AXLES

200 Weston Mott Henderson, 28 1/2" centers	18.00
150 Weston Mott Elmore	17.50
35 Demot coaxed type (complete)	10.50
250 Car-Nation tubular axles (complete)	10.00

TRUCK AXLES

150 Portland fronts, with hubs, bearings, caps	25.00
100 Portland rears, with hubs and caps	20.00
5 Sheldon 1 1/4 square rear, ball bearing hubs, brakes and adjustable radius rods	35.00
30 Dart Sheldon jackshafts (chain drive)	20.00

STEERING GEARS

6 Gemmer left hand steer	17.50
75 Barnes (right hand steer)	9.00
100 Speedwell (right hand steer)	14.00
Krit (left or right hand steer)	10.00

RADIATORS

Flat tube Honeycomb to fit Ford	16.50
"V" shape (brass) to fit Ford	22.50
50 Briscoe 24x24 1/2 Honeycomb	12.00
34 Truck radiators, 24x33	16.00

"V" shape radiators for any car
Write for prices on plain and "V" shape

BODIES

1 Taxicab, upholstered and painted	100.00
5 Wall (unupholstered) 33" wide, 89" long	25.00
20 Henderson (unupholstered)	20.00
15 Midland (unupholstered)	10.00
15 Finaut, two-pass, cyclecar	10.00

Write for prices on above bodies upholstered.

WHEELS

200 30x3", to fit Ford cars	1.50
175 30x3 1/2", to fit Ford cars	2.00
90 32x3 1/2", metric	1.00
200 34x4" with Goodyear Q. D. reversible rims	4.00
125 36x4" with Goodyear Q. D. clincher rims	3.50

SPRINGS

200 three-quarter elliptic, 49 1/2"x2"x7 and 8 leaves	4.00
100 Scroll elliptic, 37 1/2"x2"x6 leaves	3.25
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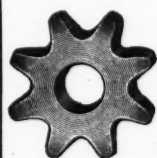
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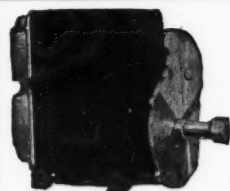


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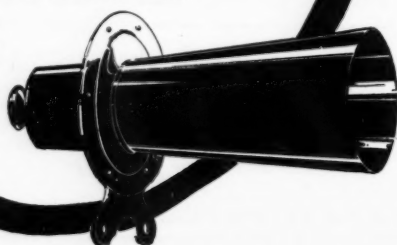
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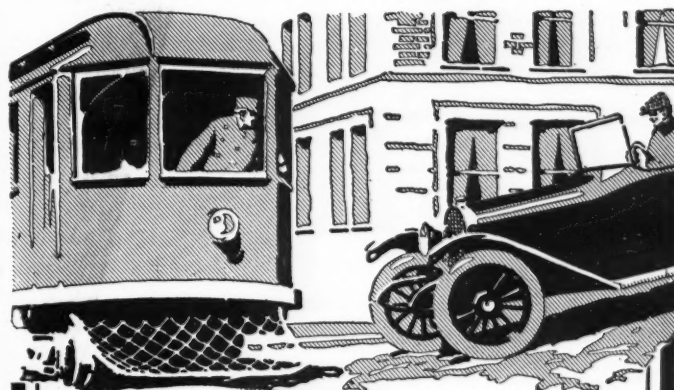
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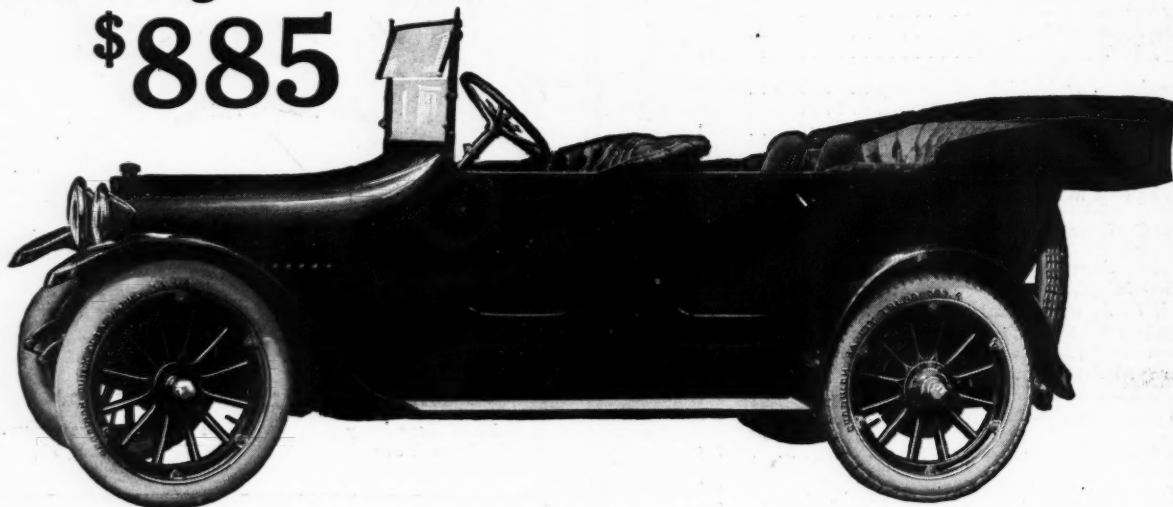
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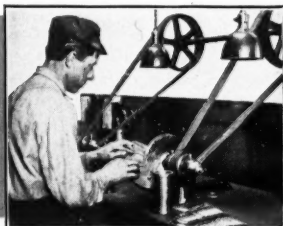
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